An analysis of alcohol use and possible confounding risk factors for risky sexual behaviour amongst women in the rural Western Cape and urban Gauteng provinces

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Declaration

I, Makobetsa Khati, hereby declare that this thesis is based on my original work, except where acknowledgements or references indicate otherwise, and that neither the whole work nor part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Abbreviations and acronyms

AIDS	Acquired immune deficiency syndrome
AUDIT	Alcohol Use Disorders Identification Test
CI	Confidence Interval
EAs	Enumeration areas
HAART	Highly active antiretroviral therapy
HE	Heavy episodic (drinker)
HIV	Human immunodeficiency virus
IUD	Intrauterine device
MRC	Medical Research Council
OR	Odds ratio
P-value	Probability value
REC	Research Ethics Committees
SES	Socio-economic status
STIs	Sexually transmitted infections
UCT	University of Cape Town
UNAIDS	Joint United Nations Programme on HIV/AIDS
UP	University of Pretoria
USA	United States of America

Definition of key variables used in the study

Alcohol dependence	Positively answering "yes" at least 2 of the 4-item CAGE questions (questions 7.22-7.25, Appendix A).
Binge drinking	Consumption of more than three units of alcoholic drinks at one sitting for females within the previous 12 months.
Current smokers	Having smoked a cigarette during the past 30 days.
Current use of contraceptive	Currently using any method, including traditional herbs/remedies or any other unproven methods to delay or avoid getting pregnant.
Effective contraceptive	Any method, which has been empirically shown to be effective in preventing pregnancy such as a pill, intrauterine device, injections, diaphragm, condom, female sterilisation, male sterilization or abstinence.
Household hunger	Sometimes or often going hungry or having no food to eat.
Indigenous language	Any of the following languages: IsiNdebele; siXhosa; IsiZulu SeSotho; SeTswana; SePedi; SiSwati; Tshivenda and Xitsonga.
Multiple-partners	Having had more than one sexual partner in the past three months.
Parity	Having given birth to at least one viable/live child.
Regular use of cigarettes	Having smoked at least 100 cigarettes in a lifetime.
Risky drinking	A pattern of alcohol consumption that is above recognised sensible drinking levels − represented by the 10-item AUDIT score of above 8.
Risky sexual behaviour	Having multiple-partners and/or unprotected sex
Unprotected sex	Not always using a condom with a casual or regular partner in the past three months, or not having used a condom in the most recent sex act.
Working	Self-employed or doing part-time or full time paid job.

Abstract

Background: Risky sexual behavior is the major cause of unwanted pregnancies and sexually transmitted infections among urban and rural women in South Africa. Yet, no study published to date has investigated and compared factors associated with risky sexual behaviour among urban and rural women in South Africa.

Aim: The general aim of this thesis is therefore to analyse alcohol consumption variables and possible confounding risk factors associated with risky sexual behaviour amongst women in the urban city of Tshwane in Gauteng and the rural Western Cape sites, respectively.

Methods: A cross-sectional population-based analytical study using multi-stage sampling methods was performed. The study population comprised 606 urban and 412 rural women between 18 and 44 years. Relevant data on alcohol and substance use variables, demographics, socio-economic status (SES) and household factors, community factors, psycho-social factors, partner characteristics, sexual behaviour, general and reproductive health variables were extracted for statistical analyses.

Analyses: First, univariate analysis was used to identify frequencies and percentages of various independent and dependent variables in the two sites; accompanied by a Chi-squared (χ^2) test of association to determine if there were significant differences in the respective variables between the two sites. Correlation between the respective independent variables (alcohol and substance use), possible confounders (demographic factors, SES and household hunger, psycho-social factors, current partner characteristics, community and social support, relevant general and reproductive health variables and sex related variables) and the dependant variables (multiple sex partners, unprotected sex and combined risky sexual behaviour) was analysed using two way frequency tables and tested for statistically significant association using a χ^2-test in the

bivariate analysis. Those independent variables that had significant ($p \leq 0.05$) pair-wise associations with the dependent variables in both the χ^2 bivariate analysis and univariate logistic regression analysis were fitted into a stepwise, backward elimination multivariate logistic regression analyses model. Bonferroni correction was used to counteract the problem of multiple comparisons.

Ethics: The research was approved by the Faculty of Health Sciences Research Ethics Committees (REC) of the Universities of Pretoria (121/2005) and Cape Town (381/2005; renewal number 001/2007).

Results: Multivariate logistic regression analysis showed that the urban Gauteng women who binge drink were at significantly higher risk (OR=2.92±1.04; 95% CI=1.45–5.89; p=0.003) to have multiple sex partners. Multivariate logistic regression analysis also showed that in Gauteng, women who had a currently working partner (OR=0.48±0.15; 95% CI=0.26–0.90; p=0.022), or had a close knit community (OR=0.47±0.14; 95% CI=0.26–0.85; p=0.013), or had apparent good health (OR=0.25±0.07; 95% CI=0.13–0.46; p<0.001), respectively, were likely to have multiple partners. For the rural Western Cape women, good health (OR=0.28±1.6; 95% CI=0.09–0.87; p=0.028), being of Coloured race (OR=0.24±0.16; 95% CI=0.06–0.91; p=0.036) or having had a husband or boyfriend as recent sex partner (OR=0.19±0.12; 95% CI=0.05–0.67; p=0.010), respectively, were protective for having multiple sex partners.

Conclusion: Risky sexual behaviour, in particular unprotected sex, is high among women in both the urban Gauteng and the rural Western Cape. The results suggest that sex education awareness and alcohol rehabilitation programmes particularly targeted to women who are risky drinkers in the urban Gauteng is needed.

Chapter One

1.0. Introduction

South Africa is in the throes of an acquired immune deficiency syndrome (AIDS) epidemic (UNAIDS, 2012). The impact is devastating South Africans, especially poor women from rural and urban communities, who are generally of low socioeconomic status. Poor women from both the rural and urban communities have high risk sexual behaviours because of reduced capacity to negotiate safer sexual practices (Dunkle *et al.*, 2004; Gillespie & Kadiyala, 2005; Kalichman *et al.*, 2012b) . High risk sexual behaviour is generally defined as any behaviour that increases the probability of negative consequences associated with sexual contact, including vulnerability to HIV infection, AIDS or other sexually transmitted disease and unplanned pregnancies (McEwan *et al.*, 1992). These risky sexual behaviours are considered in broad categories that include having multiple partners, having risky casual or unknown partners, failure to discuss the risk topic before intercourse, failure to consistently use effective prophylactics such as condoms (McEwan *et al.*, 1992; Taylor-Seehafer & Rew, 2000). Therefore, in this context, I will use sexually transmitted infections (STIs) and mostly HIV infection as a consequence indicator of risky sexual behaviour.

To prime the reader, I will first provide a review of putative factors associated with risky sexual behaviours such as poor socio-economic status, food insufficiency and early initiation of sexual intercourse. I will then provide a critical review and summary of epidemiological evidence showing a strong association between alcohol use and risky sexual behaviour because several independent studies done elsewhere on the predictors of high risk behaviour has indicated a consistent relationship between

alcohol use and risky sexual behaviour (Baliunas *et al.*, 2010; Chandra *et al.*, 2003; Dal Cin *et al.*, 2006; Kalichman & Cain, 2004; Kalichman *et al.*, 2011; Kalichman *et al.*, 2012a; MacDonald *et al.*, 2000a; MacDonald *et al.*, 2000b; MacDonald *et al.*, 1995; Morojele *et al.*, 2006; Rehm *et al.*, 2011; Shuper *et al.*, 2009; Shuper *et al.*, 2010). This will be followed by an overview of theoretical explanations for the link between alcohol use and risky sexual behaviour. To lay a foundation for the study hypothesis, I will conclude the introduction by providing an overview of the urban-rural dichotomy in South Africa, especially in relation to the socio-economic conditions, sexual behaviours and alcohol consumption patterns in the urban and rural women.

1.1. Socio-economic status and risky sexual behaviour

Low socioeconomic status has been shown to be associated with inconsistent condom use, transactional sex and HIV infection, which are all elements of risky sexual behaviour, in South Africa (Dunkle *et al.*, 2004; Gillespie & Kadiyala, 2005; Kalichman *et al.*, 2012b). Thus, poverty, which is a common and obvious indicator for poor socioeconomic status, makes individuals more vulnerable to HIV infection (Kalichman *et al.*, 2012b) for a variety of reasons. First, poor households are vulnerable to HIV infection and disease progression because poverty, which results in poor nutrition and living conditions, weakens the immune system (Beisel, 1987; Chandra, 2002; Marcos *et al.*, 2003); the physiological system designed to fight infections and contain diseases. Furthermore, poverty is associated with lack of education and empowerment (Doherty & Colvin, 2004). Therefore, poor people do not only have less access to information but also a reduced capacity to negotiate safer sexual practices; thereby rendered more vulnerable to HIV infection. Poor individuals are also less able to maintain a certain level of consumption such as increased expenditure on antiretroviral therapy and good health care when faced with some new

adversity such as HIV infection because of their limited resources. Patients in the lower socio-economic strata are less likely to be prescribed triple therapy such as highly active antiretroviral therapy (HAART) even after adjustment for clinical characteristics (Wood *et al.*, 2002). This trend resonates globally across nations. Richer countries have much lower incidence and prevalence of HIV positive cases compared to poorer countries. A massive 95% of people with HIV live in developing countries (UNAIDS, 2012).

Nonetheless, HIV infection is by no means confined to the poor. Wealthier people have their own risk factors such as access to disposable income and frequency of travel, which are associated with increased risk of HIV infection (Dallabetta *et al.*, 1993; Decosas & Adrien, 1997; Doherty & Colvin, 2004; UNAIDS, 2001, 2012). The Nelson Mandela/ Human Sciences Research Council (NM/HSRC) study showed that among black South Africans, the chance of being infected with HIV was similar across the socioeconomic strata as measured by self-reported income level (Shisana & Simbayi, 2002). Furthermore, the study showed that there is evidence for the association between level of education and HIV infection. Among black South Africans, 21.1% of those with a matric certificate were HIV positive compared to 8.7% of those without schooling (Shisana & Simbayi, 2002). These data suggest that there is an association between level of education and risk of HIV infection, which might also be confounded by age and rurality. Thus older generation might be less educated but lower risk than sexually active younger adults. Similarly rurality may be associated with lower education but also lower risk of HIV infection. In contrast, studies in the middle class populations have shown a slightly different picture in that the prevalence of HIV tends to decrease in the managerial and higher job bands regardless of race (Doherty & Colvin, 2004).

In addition, according to a presentation by Anthony Mbewu, erstwhile president of the MRC, on the 16th March 2005 to the portfolio committee on science and technology on the socioeconomic impact of HIV and AIDS, he mentioned that studies have shown that poor education is a risk factor for HIV infection and AIDS progression (Mbewu, 2005). He also mentioned that several South African studies have shown an association between HIV seroprevalence and work migrancy; or living in poor or meagre condition. Mbewu and others argue that concomitant STIs, which are common among migrant workers increase transmission of HIV during sexual intercourse many fold (Mbewu, 2005; Reddy *et al.*, 2003). A similar phenomenon, described by Sydney Kark, occurred when the diamond mines were opened in Kimberley in the 1870s, which were accompanied then by increasing rates of STIs that had been rare in South Africa hitherto (Kark, 1949). Kark was a pioneer in analysing the disease that was decimating Africans and clarified the connection between syphilis, a sexually transmitted bacterial disease, and the socio-political climate of the day. He defined the 'social pathology' of syphilis and identified social dislocation[1] as a powerful determinant of the spread of syphilis (Kark, 1949). There are striking parallels between the South African syphilis epidemic described by Kark, and the current, devastating spread of HIV infection across South Africa and the continent (Myer *et al.*, 2003). Poor socioeconomic conditions provide fertile ground for risky sexual behaviour and hence the spread of HIV (Barnett *et al.*, 2000).

[1] Social dislocation: Enforced migrant labour system that removes young men in huge numbers from stable families in rural areas to the squalor of single sex hostels to provide cheap labour for the diamond and gold mines.

1.2. Food insufficiency and risky sexual behaviour

Directly linked to poor socioeconomic status is food insufficiency[2], which is in turn inextricably linked to risky sexually behaviour and HIV infection (de Waal & Whiteside, 2003; Kalichman *et al.*, 2012b; Weiser *et al.*, 2007). Food insufficiency increases risky sexual behaviour, especially among poverty stricken women who are often dependent on others for food and other resources and whose human rights are inadequately protected (Bainame, 1997; Kalichman *et al.*, 2012b).

Women in parts of sub-Saharan Africa such as Botswana and Swaziland often lack control over food supply at home, while also bearing the responsibility for caring for children, elder household members and household members who are ill (Rajaraman *et al.*, 2006). Previous qualitative studies have shown that women may engage in transactional[3] sex or get involved in intergenerational[4] relationships in order to procure foods for themselves and their children (Gillespie & Kadiyala, 2005; Mill & Anarfi, 2002). This was supported by an independent cross-sectional study, among 320 female sex workers in Lagos, Nigeria, where 35% of respondents reported that poverty and lack of other means of getting daily food was responsible for their decision to become sex workers (Oyefara, 2007). In addition, as a consequence of their dependence on their sexual partner for food, women may have little control over condom use. For instance, qualitative studies in Botswana and Swaziland have found that poor women often lack power to negotiate for safer sex in their relationships (Bainame, 1997; Buseh *et al.*, 2002; MacDonald, 1996) and food insufficiency was associated with multiple risky sexual practices (Weiser et al., 2007). Women who reported lacking sufficient

[2] Lacking adequate food supply to meet daily needs over the previous 12 months.
[3] Transactional sex is broadly defined as sex offered in exchange for money or other material resources and tangible benefits.
[4] Intergenerational sex is defined as having a partner whose age is at least 10 years younger or older than that of the participant.

food to eat had an 80% increased odds of selling sex for money, a 70% increased odds of engaging in unprotected sex and reporting lack of sexual control, and a 50% odds of intergenerational sex (Weiser et al., 2007).

1.3. Alcohol use and risky sexual behaviour: epidemiological evidence

Studies examining the link between alcohol and risky sexual behaviour at the global level typically ask participants about their overall involvement in some high risk sexual behaviour and their overall frequency and quantity of alcohol use. Alcohol use is strongly related to the decision to have risky sex (Baliunas *et al.*, 2010; P. S. Chandra *et al.*, 2003; Cooper, 2002; Kalichman *et al.*, 2011; Kalichman *et al.*, 2012a;. MacDonald *et al.*, 2000a; MacDonald *et al.*, 2000b; Morojele *et al.*, 2006; Rehm *et al.*, 2011; Shuper *et al.*, 2009). For example, recent meta-analysis studies have shown that alcohol consumption increased the risk of unprotected sex (Rehm *et al.*, 2011; Shuper *et al.*, 2009) and consequently HIV infection (Baliunas *et al.*, 2010; Shuper *et al.*, 2010).

Furthermore, a national survey of more than 17,000 USA collegiate youth found that heavy episodic[5] (HE) drinkers, also commonly defined as binge drinkers, were nearly three times as likely to have had multiple sex partners in the past month than were non-HE drinkers (Wechsler *et al.*, 1995). Similarly, a national study of more than 4,000 sexually experienced USA youth aged 14 to 21 found that proportions of young men who had multiple partners in the past month rose from 23% to 61% as the number of alcohol-related behaviours increased (Santelli *et al.*, 1998). The proportions of

[5] Heavy episodic (HE) drinkers were defined as having five or more drinks on a single occasion during a specified period.

alcohol-related risky sexual behaviour among young women aged 18 to 30 years rose from 8% to 48% (Graves, 1995). Taken together, these studies showed that in the USA, rates of multiple partnerships were two to three times greater among HE than non-HE drinkers and were similar for men and women (Graves, 1995; Santelli et al., 1998).

Interestingly, in contrast to the consistent positive link between general drinking patterns and having multiple partners (Wechsler et al., 1995), HE and non-HE drinkers were in earlier study found not to differ in rates of condom use (Wechsler *et al.*, 1994). The youth risk behaviour survey done in the USA among non-college youth also found that alcohol experience failed to discriminate condom users from non-users at last intercourse (Lowry *et al.*, 1994). However, Graves found that more frequent HE drinking among young adults was associated with lower rates of condom use (Graves, 1995). This was corroborated by an independent study, which reported that a proportion of British university students who had unprotected sex with a stranger rose from 4% among non-drinkers to 27% among heavy drinkers (McEwan *et al.*, 1992). This measure, however, confounded indiscriminate partner choice with failure to use a condom, thus making it unclear whether the observed co-variation with drinking pattern reflects variance due to indiscriminate behaviour or to non-use of condoms (Cooper, 2002). Other studies have reported that the frequency of drinking proximal to intercourse is positively associated with the frequency of having unprotected sex or with the number of unprotected sex episodes in a given time period (O'Leary *et al.*, 1992). Such data are also confounded because both alcohol use and risky sex measures depend on frequency of intercourse (Cooper, 2002).

Notwithstanding, similar trends were observed in developing countries such as India and South Africa, where sensation-seeking as a personality variable was significantly associated with risky sexual behaviour among heavy alcohol users (Chandra *et al.*, 2003; Kalichman & Cain, 2004; Kalichman *et al.*, 2011; Kalichman *et al.*, 2012a; Morojele *et al.*, 2006). In an in-depth qualitative study conducted in Gauteng, South Africa, among adults aged 24 to 44 years it was reported that there were high levels of alcohol consumption and unprotected sex (Morojele et al., 2006). The common trend in South African townships and informal settlements is weekend risky drinking[6] and intergenerational and/or transactional sex where younger women frequent the drinking venues to have sex with older men (referred to as sugar daddies in township slang) for material benefit (Morojele et al., 2006). What is also of great concern in South Africa is that there are high rates of unprotected sex occurring among HIV-positive individuals when drunk (Kiene *et al.*, 2008). In a recent, self-reported daily diary prospective cohort study that followed 58 HIV positive women and 24 HIV positive men over 42 days, the participants drank an average of 6.13 drinks per session and reported 4297 sex events, of which 80.17% were without condom use (Kiene et al., 2008). About 58% of these unprotected sex events were with presumed HIV-negative partners or with partners with unknown HIV status (Kiene et al., 2008). Despite several limitations acknowledged by the authors (Kiene et al., 2008), the study suggests that moderate to high risk drinking before sex by female and/or male partner significantly increases the likelihood and rate of unprotected sex among HIV positive individuals. Several studies conducted by Kalichman and colleagues have shown that alcohol consumption is closely associated with unprotected sex, multiple sex partners, risky sexual behaviour in general and the risk for STIs in Cape Town, South Africa

[6] Risky drinking was defined as consumption of more than five drinks per day for males and more than three drinks per day for females during some of all weekend within the previous 12 months.

(Kalichman & Cain, 2004; Kalichman *et al.*, 2011; Kalichman *et al.*, 2012a; Kalichman *et al.*, 2012b). Considered together, the studies reviewed above indicate a consistent link between heavy alcohol use and risky sexual behaviour.

1.4. Explanations for the link between alcohol use and risky sex

A number of plausible theoretical models exist to explain the link between alcohol use and risky sexual behaviour (Halpern-Felsher *et al.*, 1996). The most widely endorsed models are:

Acute causal effect of alcohol: This model assumes that the acute effects of alcohol intoxication cause one to take sexual risks than otherwise would be taken (M.L. Cooper, 2002). The mechanism of this effect is underpinned by two contrasting theories. The alcohol myopia theory (Steele & Josephs, 1990) posits that alcohol disinhibits behaviour primarily as a result of its pharmacologic effects on information processing. By reducing the scope and efficiency of information processing, simple, highly salient cues that instigate behaviour such as sexual arousal continue to be processed, whereas more distal and complex cues that would ordinarily inhibit risky sexual behaviour because of the possibility of undesirable consequences such as contracting HIV are no longer adequately processed. Two independent studies lend support to this theory, at least in the immediate situation. In a first study, male undergraduate students were randomly assigned to one of three conditions (no alcohol control, placebo, intoxicated) then divided into low and high arousal groups on the basis of their self-reported response to a film depicting a potential sex scene (T. K. MacDonald et al., 2000b). The results of this study showed that only those subjects who were both intoxicated and aroused reported stronger intentions to have unprotected sex. Presumably, intoxicated subjects had sufficient cognitive capacity to process arousal cues, but unlike their sober counterparts, lacked sufficient capacity to

process simultaneously more remote inhibitory cues (MacDonald et al., 2000b). A second study showed that stamping the hands of college students as they entered a bar with a message highlighting the threat of AIDS reduced the negative effects of alcohol use on non-usage of condoms (MacDonald et al., 2000a). By increasing the salience of AIDS, the hand stamp presumably facilitated retrieval of condom-related cues among intoxicated patrons who otherwise lacked the cognitive capacity to retrieve this cues (MacDonald et al., 2000a). Alcohol is hypothesised to have its strongest effects when behaviour is controlled by instigatory and inhibitory cues that are strong and nearly equal in force (Steele & Josephs, 1990). When instigatory cues are strong and inhibitory cues are weak, the behaviour is likely to occur regardless of the individual's sobriety. Under the reverse, the behaviour is unlikely to occur, again regardless of the individual's sobriety. Taken together, the two studies (MacDonald et al., 2000a; MacDonald et al., 2000b) support this notion and suggest that individuals respond to the more salient of two sets of cues in a given situation, be they instigatory or inhibitory

In contrast, expectancy model argues that an individual's behaviour after drinking is driven by pre-existing beliefs about the effect of alcohol on behaviour, in the manner of a self-fulfilling prophecy (Lang, 1985). Thus, individuals who believe that alcohol promotes risky sexual behaviour are more likely to engage in such a behaviour when they are drunk than those who do not hold the belief. Expectancy formulations thus indicate that the strength and nature of individually held beliefs about the effect of alcohol should moderate the acute effects of alcohol on sexual risk taking (Cooper, 2002; Lang, 1985). Empirical evidence also supports the expectancy theory. In a laboratory study, participants who believed that they had consumed alcohol (although

none had in actual fact) reported greater sexual arousal and they seduced their partners only if they also held strong beliefs that alcohol enhance sexual desire (George *et al.*, 2000). Thus, the mere belief that alcohol had been consumed activated pre-existing beliefs about alcohol's effects, which in turn generated feelings, cognitions and behaviour consistent with these beliefs.

In summary, although the expectancy and alcohol myopia theories differ in factors hypothesised to moderate the effects of alcohol on risky behaviour (namely, the nature and strength of competing cues versus individually held beliefs about alcohol effects), both attributes causality to the acute effects of alcohol intoxication and assume that these effects unfold over a brief time course.

Spurious model: A second alternative model invokes a third variable explanation in which stable aspects of the individual or his or her life situation are thought to cause both drinking and risky sexual behaviour (Cooper, 2002). For instance, a person may engage in both behaviours to satisfy a thrill or sensation seeking need, because of poor impulse control or coping skills in an effort to cope with negative emotions (Cooper, 1992; Leigh & Stall, 1993). Alternatively, an individual may drink and have risky sex as part of a larger lifestyle, such as being single or living in a fraternity house where both behaviours are tacitly or in some cases explicitly encouraged (Baer, 1994). Research lends support to this view by showing that the same personality traits such as impulsivity and negative emotions prospectively predict involvement in both behaviours (Caspi *et al.*, 1997) and that parallel motivational process underlie both behaviours (Cooper *et al.*, 2000). A direct test of this hypothesis was provided by two studies in which the relationship between measures of alcohol use and risky sexual

behaviour was estimated both by before and after controlling for plausible third variables (Justus *et al.*, 2000; Kalichman *et al.*, 1996). In both studies, sensation seeking was found to account completely for the relationship between drinking and risky sexual behaviour (Justus et al., 2000; Kalichman et al., 1996). Therefore, it seems plausible that, at least under some circumstances or for some individuals, the link between alcohol use and risky sexual behaviour can be adequately explained by the third variable.

1.5. The urban-rural dichotomy in South Africa

In South Africa, communities are either classified as urban or rural. Urban areas are generally next to the cities, industrialised and densely populated; whereas rural areas are usually placed outside of the cities; agrarian and sparsely populated. In South Africa, rural areas can further be classified into either a commercial agriculture category or a traditional smallholder farmer category. In this dualistic agricultural structure there are over 60,000 commercial farms that occupy almost 87% of the total agricultural land in South Africa and produce more than 95% of the market output (Kirsten & Vink, 2003). In contrast, traditional smallholder farms, which are found mostly in the former homelands, occupy 13% of the agricultural land in South Africa (Kirsten & Vink, 2003). Furthermore, there are over a million African households living in former homelands that have no access to arable land at all; 1.4 million that have no livestock and 770,000 households that have neither (Kirsten & Vink, 2003).

In general, rural farming and non-farming areas in South Africa are characterised by lack of socio-economic development and infrastructure, as well as lack of opportunities for employment and income generation. Unlike their urban counterparts, the majority

of rural women live under extremely poor conditions. In addition, they are faced with limited access to education and skills training, which further contributes to a life of poverty. Many rural women live too far from health facilities and accessing them is a challenge. Furthermore, many rural public health clinics are poorly resourced and most rural women face healthcare workers who are judgemental and usually do not maintain confidentiality. Condoms are also not easily accessible to rural women compared to their urban counterparts (Lurie *et al.*, 2008). These unfavourable socio-economic conditions for rural women make them to be potentially vulnerable to risky sexual behaviour and HIV infection. For instance, one study conducted in South Africa showed that rural women were significantly ($p<0.001$) less likely than their urban counterparts to report consistent condom use with regular or casual partners (Lurie *et al.*, 2008). A research conducted by the International Organization for Migration (IOM) in South Africa showed that high risk sexual behaviour between women and men working on farms was common and the incidence of multiple sexual relationships was unexpectedly high (IOM, 1998, 2010). This is in part attributable to the seasonal nature of the work. For example, during the harvest season large numbers of temporary workers migrate to rural commercial farms, leading to increased levels of sexual networking. Desperate to secure employment for the duration of the harvest, it is not uncommon for young women to have sex with male supervisors called "indunas" in exchange for a job (IOM, 2010). Becoming a girlfriend of an "induna" for the harvesting season can guarantee accommodation on the farm and better working conditions. The IOM survey found that 52% of female workers interviewed on South African farms had exchanged sex for food, clothing, gifts or money (IOM, 2010). Furthermore, compared to their urban counterparts, female farm workers have lower levels of knowledge about HIV/AIDS and higher levels of unsafe sexual behaviour

(IOM, 1998, 2010; Lurie *et al.*, 2008; Rollins *et al.*, 2007). Despite the lack of knowledge about HIV/AIDS; adverse socio-economic conditions that female farm workers endure everyday subsume the HIV/AIDS threat. To put it simply, because the daily life of an average rural woman is a struggle in so many ways; HIV/AIDS appears as a distant threat. The urban-rural dichotomy in South Africa, especially in relation to the socio-economic fissure and HIV/AIDS vulnerability fits with the Jaipur paradigm (Figure 1), which hypothesised that there is a relationship between levels of social cohesion, income distribution and the gradient and final peak of an HIV epidemic curve (Barnett et al., 2000).

In addition to the poor socio-economic conditions, risky sexual behaviours, and the HIV/AIDS threat; rural women are also susceptible to high risk alcohol use compared to their urban counterparts. A recently published study that assessed and compared the extent of high risk drinking in the adult female population of a rural and urban region in South Africa found that 46% (188/412) of the women interviewed in the rural Western Cape region were current drinkers compared to 27% (166/606) in the urban Gauteng region; and that 68% (128/88) of the current dinking rural women compared to 20% (33/166) of the current drinking urban women were high risk drinkers (Ojo *et al.*, 2010). Another study published in the same year by the same research group using the same data to answer a different research question found that the rural Western cape women were significantly at a higher risk of alcohol exposed pregnancy compared to their urban counterparts (Morejele *et al.*, 2010). The now abolished "dop" system, which involved part payment of farm workers in low grade wine, promoted excessive alcohol use among members of some farming communities in the rural Western Cape region (London, 1999). Such patterns of alcohol consumption still prevail.

Taken together, from the above overview we know that most rural South African women compared to their urban counterparts live under poor socio-economic conditions with limited disposable income; and have high risk sexual behaviours and high risk drinking behaviours, respectively. We also know some factors associated with high risk drinking in the urban and rural women in South Africa. However, we do not know the risk factors associated with risky sexual behaviour and if there is an association between alcohol drinking and risky sexual behaviour variables in the rural and urban South African women. Therefore, the current study is important because it seeks to answer the above research questions by analysing alcohol use and possible confounding risk factors associated with risky sexual behaviour amongst women in the urban city of Tshwane in Gauteng and the rural Western Cape sites, respectively.

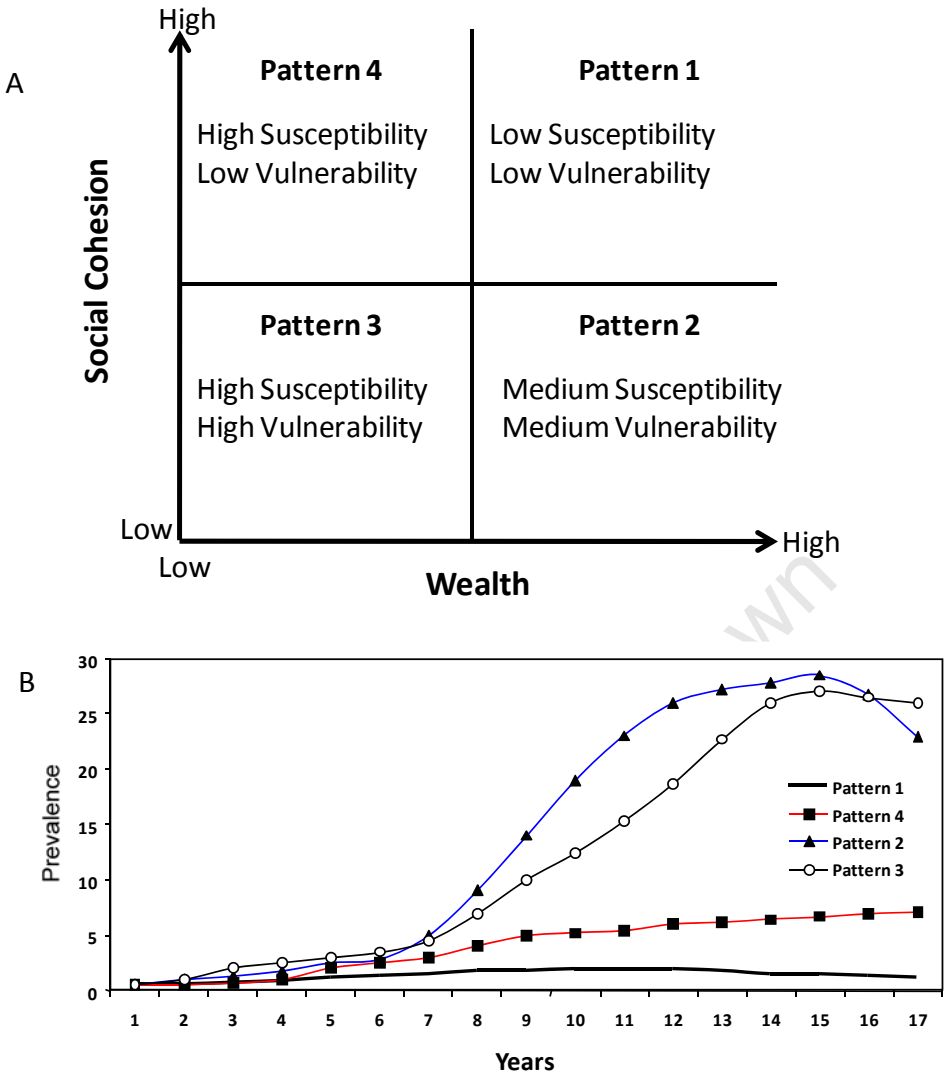

Figure 1: The Jaipur paradigm. **(A)** The relationship between degree of social cohesion and wealth to the attributes of HIV susceptibility and vulnerability. (**B**) Hypothetical HIV prevalence curves corresponding to each one of the four Jaipur paradigm patterns. The patterns never exist in their pure form (Barnett et al., 2000).

1.6. Study hypothesis

In the light of the studies reviewed in the introduction above, prevailing socio-economic, cultural and demographic conditions in South Africa, my hypothesis for the current study is that alcohol use in urban areas such as around the city of Tshwane in Gauteng is a risk factor for risky sexual behaviour, which can predispose one to HIV infection, whereas alcohol in rural areas may play a very different kind of role such as being used for pastime or recreation because of lack of resources such as recreational facilities, limited disposable income for transactional sex and much more circumscribed networks. The hypothesis is that in the rural communities, alcohol would not result in risky sexual behaviour in the same way that it would in urban areas.

This thesis therefore tests the hypothesis that alcohol use among urban South African women is positively associated with risky sexual behaviour, whereas alcohol use among rural South African women plays a very different kind of role that is not necessarily linearly associated with risky sexual behaviour. These contrasting hypotheses are based on observations from urban areas that suggest that alcohol may be a risk factor for risky sexual behaviour whereas, in rural areas, limited disposable income for transactional sex and circumscribed networks mean that alcohol use would not result in increased risky sexual behaviour in the same way that it would in urban areas.

1.7. Study aim and objectives

Aim: To analyse alcohol consumption variables and possible confounding risk factors associated with risky sexual behaviour amongst women in the urban city of Tshwane in Gauteng and the rural Western Cape sites, respectively.

Objectives:

- To compare (a) alcohol consumption and other substance use variables (b) demographic variables, (c) socio-economic and household hunger variables, (d) psycho-social variables, (e) current partner characteristics, (f) community and social support variables, (g) general and reproductive health variables and (h) sexual behaviour variables between the two sites.
- To determine if the alcohol consumption independent variables and possible confounders analysed above are associated with multiple sex partners, unprotected sex or combined risky sexual behaviour (dependent variables) amongst women of child bearing age-between 18 and 44 years in the urban city of Tshwane in the Gauteng province and their rural counterparts from the Western Cape and to compare the strength of association.
- To fit the independent variables and possible confounders that had significant pair wise associations with the risky sexual behaviour dependent variables in a multivariate regression model.

Chapter Two

2.0. Methods

2.1. Study areas

The study areas comprised a densely populated urban area of Gauteng province, and a sparsely populated rural area of the Western Cape Province, previously described (Morejele *et al.*, 2010; Ojo *et al.*, 2010).

The rural site borders the Atlantic Ocean on the west and agricultural land on the east, and spans a land area of approximately 15,311 km^2 (Morejele *et al.*, 2010). It is located in three municipalities of the West Coast District Municipality, namely Cederberg, Bergrivier and Swartland. Based on the 2001 population census, the combined total population of the three municipalities is around 160,000 people (Statistics South Africa, 2003). Agriculture, forestry and fishing make up about one third of the economy of the region. The inhabitants of this area are primarily Afrikaans-speaking people of mixed heritage, referred to as "Coloured" in South Africa. The now abolished dop system promoted excessive alcohol use among members of farming communities in this region, and such patterns of alcohol consumption prevail (London, 1999). In 2011, the HIV prevalence among antenatal women in the Cape Winelands district, which includes the rural Western Cape study area, was 15.7% (DoH, 2011).

The urban Gauteng site is located within the City of Tshwane Metropolitan Municipality, and spreads over an area of 2,199 km^2 (Morejele *et al.*, 2010). It has a population of about 1.98 million people and is highly industrialised and urbanised (Statistics South Africa, 2003). The study area comprises approximately 341,859

residents comprising white (14.1%), coloured (7.4%), and black (78.3%) people (Statistics South Africa, 2003). Alcohol is widely available within this area through legal and illegal outlets, and it is becoming increasingly normative for urbanised women in areas such as these to drink alcohol (Morejele *et al.*, 2010). In 2011, the HIV prevalence among antenatal women in the City of Tshwane Metropolitan Municipality was 24.4% (DoH, 2011).

2.2. Sample size

The minimum sample size for each of the urban and rural area was in the original study determined to be 352 and 293 women in the urban and rural areas, respectively. The minimum sample size for each of the urban and rural sites was determined by conducting the following power analyses: In order to have a large enough sample to obtain expected correlations between monthly frequency of "risky drinking", and psycho-social predictors such as spouse's/partner's drinking, the correlation in the population between these two variables was assumed to be 0.30. With a power coefficient of 0.90, and a correlation of 0.30, it was determined that at least 88 women who engaged in risky drinking within the sample will be needed (Howell, 1987). The rate of risky drinking in the urban and rural populations of women of child bearing age is approximately 25% and 30%, respectively. Thus, it was determined that at least 8800/25 = 352 women in the urban area, and 8800/30 = 293 women in the rural setting in the final sample would be needed. In order to ensure enough high risk women were identified 400 households were sampled in Gauteng and 350 in the Western Cape. In other words, in order to ensure that enough risk women were identified, the total study sample size consisted of 606 women in the urban Gauteng region and 412 women in the rural Western Cape region.

2.3. Sample selection

Data were previously collected through a multi-institutional collaboration, which included UCT, UP and the MRC (Morejele *et al.*, 2010). The study population comprised women of child-bearing age - between the ages of 18 and 44 years. In the urban area, cluster random sampling approach was used with a target of 820 women. First, 82 census enumeration areas (EAs) were randomly selected; then, within each EA, ten households were randomly selected using aerial photographs to identify the study households. Finally, one eligible woman within each selected household was randomly selected.

In the rural site (spanning three municipal areas), a stratified cluster random sampling approach with a target of 650 women was used. First, farms within the boundaries of the selected areas, with a probability proportional to the number of farms in each municipality were selected. From a total set of 1450 farms across the three municipalities, 150 farms (with over-sampling) were randomly selected to take account of un-contactable, ineligible, and non-functional farms. Finally, all eligible women in each household from each of the participating farms (n=58) we recruited; the inclusion of all eligible women per farm was decided upon due to the small number of households per farm (approximately 7), and the large distances between farms.

2.4. Data collection instrument

A structured questionnaire was used (Appendix A). It included independent and dependent variables. The dependent variable being multiple sex partners, unprotected sex and combined risky sexual behaviour. The independent variables were alcohol consumption and other substance use variables while possible confounding factors

were demographics, socio-economic and household hunger, psycho-social factors, community and social support factors, current partner characteristics, general and reproductive health (including contraceptive use and pregnancy), and sex related factors. The demographic variables included the women's age, education, marital status, self-reported socially classified racial groupings (White, Coloured, Black/African and Indian). Socio-economic variables included current employment status, household assets as proxy of socio-economic status (SES) and household hunger.

The questionnaire measures of alcohol consumption assessed the participants' lifetime and current alcohol use, and included the ten-item (AUDIT) Alcohol Use Disorders Identification Test (Saunders *et al.*, 1993). It also included a four-item CAGE questionnaire to assess alcohol dependency. The questionnaire also included measures of women's lifetime, current and regular use of cigarettes, the women's lifetime, current and effective use of contraceptives and the women's pregnancy and parity history.

2.4.1. Dependent variable

Broadly speaking, two dependent variables that corresponded to risky sexual behaviours were examined, namely multiple sex partners and unprotected sex. An analysis of combined risky sexually behaviour (i.e. multiple sex partners and/or unprotected sex), which strictly speaking constituted a third dependent variable, was also done.

2.4.2. Primary independent variables

The primary independent variables consisted of alcohol consumption and other substance use variables.

Alcohol use and other substance use

Those women who at the time of the interview reported to having ever had a drink containing alcohol were classified as lifetime users − assigned a score of "1". Those who reported to still take a drink with alcohol sometimes (question 7.3, Appendix A) or to take at least one drink containing alcohol on a typical day (question 7.11, Appendix A) were classified as current users − assigned a score of "1" and all others a "0". Of the current drinkers, those who consume over 3 alcoholic beverages on a typical day were categorized as binge drinkers − assigned a score of "1" while those who drink less than 3 alcoholic beverages or did not drink were assigned a score of "0". In addition, those current drinkers with a summed score of 8 or more of the ten-item AUDIT core questions (Saunders et al., 1993) were defined as risky drinkers and assigned a "1" and all others a "0". Alcohol dependence is defined as positively answering at least 2 of the 4-item CAGE questions – assigned a "1" on the binary scale (For 4-item CAGE questions see 7.22-7.25, section 7, Appendix A)

Those who indicated having tried or experimented with cigarette smoking, even one or two puffs were defined as lifetime users (score = 1 on the binary scale), while those who ever smoked at least 100 cigarettes or the equivalent amount of tobacco in their lifetime were classified as regular users (score = 1 on the binary scale). The respondents, who reported having smoked a cigarette during the past 30 days, were categorised as current smokers (score = 1 in the binary scale). A variable called other drugs was created and women who reported ever using at least one of the specified drugs (question 8.10 Appendix A) were classified as lifetime users and assigned a score of "1" on the binary scale.

2.4.3. Secondary/ ancillary independent variables

Secondary or ancillary independent variables that were measured in order to control for them as possible confounders consisted of mostly binary scales to assess variables within the following domains: (a) demographic factors; (b) socio-economic and household hunger (c) psycho-social factors (d) current partner characteristics (e) community and social support factors (f) substance use–including risking drinking (f) general and reproductive health factors; and (h) sexual behaviour related factors such as age of sex debut, sex under the influence of alcohol, perceptions of importance of condom use with regular or casual partner and ease of getting free condoms in the community.

Demographic factors

Age was categorised into three age groups: 18-24 years, 25-34 years and 35-44 years, respectively. Educational status was dichotomised into primary schooling or lower, versus those with secondary or above education. Marital status was categorised as legally married, traditionally married, cohabiting, never married or divorced/separated/widow. First language was categorised as English, Afrikaans, Indigenous[7] or "Other". Both sites had insignificant numbers of people speaking "Other" main languages. There were 13 in Gauteng and none in the rural Western Cape. Participants were asked to self-identify according to the Apartheid defined racially classified social groups of "Black/African", "Coloured", "White", "Asian/Indian", and "other". Both sites had very small numbers of people self-identifying as Asian/Indian and other.

[7] Indigenous languages include IsiNdebele; siXhosa; IsiZulu SeSotho; SeTswana; SePedi; SiSwati; Tshivenda and Xitsonga

Socio-economic status and household hunger

Employment status was dichotomised as unemployed or employed − assigned a score of "0" and "1" respectively on the binary scale. Employment was defined as self-employed or doing part-time or full time paid job. Unemployment was defined as those who reported no form of any employment, regardless of the duration or intensity. Scores on eight items on the possession of specified assets and amenities (electricity, a radio, a television, a telephone, a fridge, a computer, a washing machine and a cellular phone) and the ability to pay for household essentials such as food, doctor and medicines, bills (rent, light, water etc.), school supplies (books and uniform), clothes and funeral services were summed to compute a socio-economic status (SES) score. These scores were then dichotomised such that those with five or more household assets and always able to pay for household essentials were assigned a high SES denoted by a "1" and those with less than five assets and/or sometimes or never able to pay for household essentials were assigned a low SES denoted by a "0". Household hunger is defined as sometimes and/or often going hungry or having no money to buy food and was assigned a score of "1" while never or seldom going hungry was assigned a score of "0".

Psycho-social factors

The psycho-social variables included self-esteem, religiosity, male fertility entitlement, and perceptions about cultural prescriptions on childbearing. Scores on the ten-item self-esteem scale (Rosenberg, 1965) were summed and dichotomised across the 75th percentile as high "1" versus low "0" self-esteem. Scores on a 6-item religious orientation scale (Idehen, 2001) were summed, and dichotomised into high "1" and low "0" religiosity around the 75th percentile. For the male fertility entitlement, a score

of "1" was assigned to those who strongly or moderately agreed, and "0" to those who strongly disagreed or moderately disagreed with the statement: "according to your culture, men are entitled to have as many children as they wish to". A score of "0" was assigned to those who responded "always wrong" or "usually wrong", and a score of "1" to those who responded "sometimes wrong" or "never wrong" to the statement: "according to your culture, how wrong is it not to have children if you do not want to. Similarly, a score of "1" was assigned to those who generally agreed (very true or somewhat true) that according to their culture, having children is a sign that you are a worthy woman or that for a man to have children is a sign that he is a worthy man. A score of "0" was assigned to those who generally disagreed (somewhat untrue or very true) with either of the respective statements.

Current partner characteristics

A variable for older partner was created for those who had a partner aged 30 years or older and assigned a score of "1" versus those with a partner younger than 30 years, assigned a score of "0". Women's partners' educational status was categorised around Grade 8, such that those with a partner who had gone beyond Grade 8 were assigned a score of "1", and those whose partners' educational level was at Grade 8 or less were assigned a score of "0" on this scale. A variable for bingeing partner was created for those with partners who engaged in binge drinking (i.e. consuming more than five unit of alcohols per day) and assigned a score of "1" versus those whose partners did not binge drink or those without partners − assigned a score of "0". Scores of "1" were assigned on a single-item 5-point Likert scale to those who strongly agree or moderately agree with statements that relate to satisfaction with relationship; serious disagreements; physical fighting; controlling relationship and trust in the relationship,

respectively. Scores of "0" were assigned to those who neither agree nor disagree, moderately disagree, or strongly disagree with the respective statements (see questions 17.7 −17.11 on section 17 of Appendix A).

Community and social support domain

On a single-item, 5-point Likert scale, those who indicated that they had high access to recreational facilities were assigned a score of "1", while those who neither agreed nor disagreed, or moderately disagreed, or strongly disagreed were assigned a score of "0". A similar binary scoring system was used for other community related statements that included easy use of recreational facilities; easy access to buying alcohol; heavy drinking in the community; acceptance of alcohol abuse by the community; helpful neighbours and close knit community (see Section 4 of Appendix A). Scores on a six-item social capital scale (Martin *et al.*, 2004) were summed and dichotomised across the 75th percentile into weak (0) versus strong (1) social capital.

General and reproductive health

A variable for general health was created, where those who reported "excellent", "very good" or "good health" were classified as having good general health − assigned a score of "1" while those who reported "fair" or "poor" health were classified as having poor general health and assigned a "0" on the binary scale.

Those women who reported to having used or tried anything in any way to delay or avoid getting pregnant (question 11.2 Appendix A) were classified as lifetime users of contraceptive – assigned a score of "1" on the binary scale. Current use of contraceptive is defined as currently using any methods, including traditional herbs or

remedies or other unproven methods (question 11.3, Appendix A) to delay or avoid getting pregnant. Those who reported currently using any of the methods (option 1-12 of question 11.3, Appendix A) were assigned a score of "1" and those who reported "none" were assigned a score of "0". Effective contraceptive is defined as using any method, which has been empirically shown to be effective in preventing pregnancy such as a pill, intrauterine device (IUD), injections, diaphragm, condom, female sterilisation, male sterilization or abstinence – assigned a score of "1" while use of ineffective methods such as calendar/rhythm, withdrawal/coitus interruptus, traditional herbs/remedies or any unproven method was assigned a score of "0".

Parity (the number of live children given birth to) was dichotomised as at least one child − assigned a score of "1" versus no children assigned a score of "0". Those who had at least one miscarriage were assigned a score of "1" and the rest a score of "0".

Sexual behaviour variables

This included only the relevant independent variables: Lifetime sexual activity is defined as having ever had sex − assigned a score of "1" on the binary scale. Women who reported a husband or boyfriend as the last sex partner were assigned a score of "1" and all the others who reported somebody else other than their husband/boyfriend were assigned a score of "0". Women whose age of sexual debut was under 18 years were assigned a score of "0" and all the others who first had sex when they were 18 years or older were assigned a score of "1". Sex under the influence of alcohol in the last 3 months was dichotomised as never − assigned a score of "0" or at least once − assigned a score of "1". Variables for "ease of buying condoms in the community" and "ease of getting free condoms in the clinic" were created and dichotomised such

that those who reported that it was "quite easy" or "very easy" were assigned a score of "1" and those who reported "very difficult" or "quite difficult" were assigned a score of "0" (see questions 10.6 and 10.7, Appendix A). Variables for importance of using a condom with a causal or regular partner were respectively dichotomised so that those who reported "extremely important" or "quite important" were assigned a score of "1" and those who reported "quite unimportant" or "extremely unimportant" were assigned a score of "0" (see questions 10.8 and 10.9, Appendix A).

2.5. Validity and reliability of instrument

The structured questionnaire was developed by the principal investigators based on the survey tools previously used in South Africa. This included the 10 core questions of the Alcohol Use Identification Test (AUDIT) as well as quantitative estimates of alcohol consumption. In addition, the questionnaire was piloted in a neighbouring area of each site. To further prove validity and reliability; data gathered using exactly the same instrument have since been published (Morejele *et al.*, 2010; Ojo *et al.*, 2010)

Fieldworkers were trained on how to conduct face-to-face interviews with eligible women in the language of their choice. Due to the sensitivity of the alcohol use and sexual behaviour questions, additional sensitivity training was given to the fieldworkers by the principal investigators.

2.6. Data management

Since the research was conducted in the Gauteng and Western Cape provinces, data management system was established in both provinces. All the household survey material from both sites was stored in locked cabinets at the MRC under the custody of Dr Morojele.

Data analysis

Data were analyzed using Intercooled Stata 8.2 software. First, univariate analysis to identify frequencies and percentages of the dependent and various independent variables between the two study populations were calculated. This was accompanied by Chi-squared (χ^2) tests of association between respective variables and region (rural vs urban). To determine whether there were significant bivariate associations between the respective dependent and independent variables; data was analysed using logistic regression analyses. Bivariate associations were analysed using a two way frequency tables and tested for statistically significant associations using a χ^2 -test. A significant p-value of less than 5% ($p < 0.05$) resulted in the null hypothesis of no association being rejected. As the odds ratio is an additional statistical measure that characterises the strength of association between two variables, unadjusted odds ratios were calculated using univariate regression analysis when bivariate χ^2 -test analysis yielded significant ($p < 0.05$) p-values.

This was followed by entering all those independent variables that had a significant ($p < 0.05$) pair wise relationship with the dependent variables (i.e. multiple sex partner, unprotected sex and combined risky sexual behavior) in the bivariate analysis into a stepwise, backward elimination multivariate logistic regression analysis. The stepwise, backward elimination multivariate logistic regression analysis involved starting with all candidate independent variables that had significant ($p<0.05$) associations with the respective dependent variables, followed by deletion of each variable that did not have a significant association and improves the model the most when deleted. This iterative process was repeated until no further improvement was possible in the model.

2.7. Ethics and procedure

Trained fieldworkers visited the selected households and conducted face-to-face interviews with eligible women in the language of their choice. Those who provided informed consent and signed informed consent forms were interviewed. The interviews were conducted at the participants' homes, and lasted for between 15 and 90 minutes. At the end of the interview each woman was given a resource and fact sheet with information about risks of alcohol use, especially in pregnancies and contact details of services from which they could seek advice and assistance regarding alcohol problems and family planning. The research was approved by the Faculty of Health Sciences Research Ethics Committees (REC) of the Universities of Pretoria and Cape Town for the original study titled comprehensive foetal alcohol syndrome prevention programme in Western Cape and Gauteng Provinces, which provided data for the proposed study. UP REC is 121/2005. UCT REC approval number is 318/2005 and a renewal number is 001/2007.

Chapter Three

3.0. Results

3.1. Comparison of variables between the urban and rural women

Completed questionnaires were received from 83% of the rural Western Cape women and 74% of the urban Gauteng women who were approached to participate in the study. The participation rate was low 29% among potential respondents in the urban area who racial identified themselves as white. A total of 606 urban and 412 rural women responded out of a target of 820 and 650 women in the urban and rural sites, respectively.

3.1.1. Alcohol and other substance use

In Gauteng, 40.3% of the women compared to 72.3% in the rural Western Cape reported lifetime alcohol use, $p<0.001$ (Table 1). About 28% of the women in urban Gauteng and 47.6% in the rural Western Cape were current users of alcohol (Table 1). About 14.4% and 7.6% women in Gauteng, compared to 37.4% and 32.7% in the rural Western Cape were binge and risky drinkers, respectively (Table 1). Alcohol dependence among the women was 8.3% in the urban Gauteng and 41.5% in the rural Western Cape (Table 1). Only 11.5% women in the urban Gauteng started dinking alcohol before the age of 18 compared to 30.1% in the rural Western Cape (Table 1). Overall, relative to urban Gauteng more women in the rural Western Cape used alcohol and smoked cigarettes by any definition. There was a statistically significance difference ($p<0.001$) in the alcohol and cigarette use variables between the two study sites (Table 1). A very small percentage, about 5%, of women in both provinces used other drugs and there was no statistically significant difference ($p=0.518$) in lifetime use of other drugs between the two study sites (Table 1).

Table 1: Comparison of variables for alcohol and other substance use

Variable	Urban site: Gauteng (n = 606)	Rural Site: W. Cape (n =412)	p-value[a]
Alcohol use			
Lifetime use[b]	244 (40.33%)	298 (72.33%)	
Current use[c]	170 (28.05%)	196 (47.57%)	
Binge drinking[d]	87 (14.36%)	154 (37.37%)	**< 0.001***
Risk drinking[e]	46 (7.59%)	135 (32.7%)	
Alcohol dependent[f]	50 (8.25%)	171 (41.50%)	
Alcohol onset age (minor)	70 (11.55%)	124 (30.10%)	
Cigarette use			
Lifetime use	115 (18.97%)	287 (69.66 %)	**< 0.001***
Regular user	56 (9.24%)	198 (48.05%)	
Current user	61 (10.06%)	255 (61.89%)	
Other drugs[g]			
Lifetime use	27 (4.46%)	22 (5.34%)	0.518

[a]P-value <0.05 denotes significant statistical differences in the respective variables between the urban and rural site. [b]Lifetime use means having ever had a drink containing alcohol, smoked a cigarette or used other drugs, respectively. [c]Currently drinking at least one drink on a typical day. [d]Consumption of over 3 alcoholic beverages on a typical day for females. [e]AUDIT score of over 8. [f]CAGE score of over 2 for the 4-item questions. [g]Other drugs include dagga, mandrax, heroin, crack cocaine, ecstasy, and methamphetamine (tik).
***Remained statistically significant after Bonferroni correction ($p \leq 0.016$)

3.1.2. Demographics factors

The ages of the urban and rural women ranged from 18−44 yrs, with a mean of 30.2 ± 7.8 and 31.0 ± 7.4 years, respectively. All (100%) of the urban women had primary or lower education compared to only 59.4% of their rural counterparts − 40.6% of whom had secondary or above education (Table 2). The urban women were either legally (36.5%) or traditionally (63.5%) married, while 29.8% of the rural women were legally married and about 1% traditionally married (Table 2). The rest of the rural women were either cohabiting (34.7%), never married (30.3%) or divorced/separated/widowed (4.1%). In the urban Gauteng, most (81.3%) of the women were Black/African and mostly (78.6%) spoke one of the indigenous South African languages; while in the rural Western Cape most (90.5%) women were Coloured and nearly 93% spoke Afrikaans (Table 2).

Taken together, statistically significant difference ($p<0.001$) between women in the urban and rural sites were observed for all the measured demographic variables, except for age (Table 2).

Table 2: Comparison of demographic variables for women interviewed in the urban (Gauteng) and rural (Western Cape) sites

Variable	Urban site: Gauteng (n= 606)	Rural Site: W. Cape (n = 412)	p-value[a]
Age (years)			
18−24	182 (30.03%)	102 (24.76%)	
25−34	230 (37.95%)	161 (39.08%)	0.151
35−44	194 (32.01%)	149 (36.17%)	
Education			
Primary or lower	606 (100%)	244 (59.37%)	**<0.001***
Secondary or above	0 (0.0%)	168 (40.63)	
Marital status			
Legally married	221 (36.53 %)	123 (29.85%)	
Traditionally married	384 (63.47%)	4 (0.97%)	
Cohabiting	0 (0.0%)	143 (34.71%)	**< 0.001***
Never married	0 (0.0%)	125 (30.34%)	
Divorced/separated/Widow	0 (0.0%)	17 (4.13%)	
First language			
English	20 (3.32%)	2 (0.49%)	
Afrikaans	96 (15.92%)	383 (92.96%)	
Indigenous languages[b]	474 (78.61 %)	27 (6.55%)	**< 0.001***
Other	13 (2.16 %)	0 (0.0%)	
Racial Classification			
Black/African	491 (81.29%)	35 (8.50%)	
Coloured	67 (11.09%)	373 (90.53%)	**<0.001***
White	45 (7.45%)	3 (0.73%)	
Asian/Indian	1 (0.17 %)	1 (0.24%)	

[a]The χ^2-test of association was used to compare all the variables for women in the urban and rural sites, and a p-value <0.05 denotes significant statistical differences in the respective variables between the urban and rural site.
[b]Indigenous languages include any of the following: IsiNdebele; siXhosa; IsiZulu SeSotho; SeTswana; SePedi; SiSwati; Tshivenda and Xitsonga.
***Remained statistically significant after Bonferroni correction ($p\leq0.01$).

3.1.3. Socio-economic and household hunger variables

In Gauteng, 46.8% of the respondents had done paid work in the last 12 months and a slightly smaller percentage (43%) was currently working (Table 3). In the Western Cape, 82% of women had done paid work in the last 12 months and about 79.4% of the women were currently working (Table 3). The majority (67%) of women in Gauteng were classified as belonging to the high socio-economic status with only 0.3% reported cases of household hunger; compared to only 36% of women belonging to the high

socio-economic status and 12.4% reported cases of household hunger in the Western Cape (Table 3). All the socio-economic and household hunger variables were significantly ($p<0.001$) different between the two sites (Table 3).

Table 3: Comparison of socio-economic and household hunger variables

Variable	Urban site: Gauteng (n= 606)	Rural Site: W. Cape (n = 412)	p-value[a]
Paid work done in the last 12 months			
Yes	284 (46.86%)	338 (82.04%)	**< 0.001***
Employment status			
Currently working	261 (43.07) %	327 (79.37%)	**< 0.001***
Socio-economic status[c]			
High SES	406 (67.00%)	149 (36.17%)	**< 0.001***
House hold hunger[d]			
Yes	2 (0.33%)	51 (12.38 %)	**< 0.001***

[a]P-value < 0.05 denotes significant statistical differences in the respective variables between the urban and rural site.
[b]Working means self employed or doing part-time or full time paid job.
[c]High socio-economic status (SES) score was assigned to those women who possessed five or more out of the 8 specified assets or amenities (electricity; a TV set; a radio set; a landline telephone line; a cellular phone; a computer; a fridge and a washing machine) and also able to pay for household essentials. Low SES score was assigned to those women with less than five assets and sometimes or never able to pay for specified household essentials (transport; bills; doctors; school supplies; clothes and funeral expenses).
[d]Household hunger is defined as sometimes or often going hungry or having no food to eat.
***Remained statistically significant after Bonferroni correction ($p\leq0.0125$).

3.1.4. Psycho-social variables

A lower percentage (57.8%) of women in Gauteng had a high self-esteem compared to 96.4% of their Western Cape counterparts (Table 4). Roughly the same percentage of women in the urban (79.5%) and rural (75.7%) sites had high religiosity (Table 4). While there was no statistically significant difference ($p = 0.150$) in religiosity between the urban and rural women, there was a statistically significant difference in self-esteem and measured cultural variables, such as male fertility entitlement, childbearing perceptions, etc., (Table 4).

Table 4: Comparison of psycho-social variables

Variable	Urban site: Gauteng (n= 606)	Rural Site: W. Cape (n = 412)	p-value[a]
Self-esteem			
High	350 (57.76%)	397 (96.36%)	< **0.001***
Religiosity			
High	482 (79.54%)	312 (75.73%)	0.150
Male fertility entitlement[a]			
Agree	233 (38.45%)	104 (25.24%)	< **0.001***
Child bearing perception			
Childless choice is wrong	356 (58.75%)	274 (66.50%)	**0.012**
Children are a sign of a worthy woman			
Agree	396 (65.35%)	342 (83.01%)	< **0.001***
Children are a sign of a worthy man			
Agree	382 (63.04%)	336 (81.55%)	<**0.001***

[a]P-value <0.05 denotes significant statistical differences in the respective variables between the urban and rural site.
[b]According to the culture of participants in the study men are entitled to have as many children as they wish to have
***Remained statistically significant after Bonferroni correction (p≤0.008).

3.1.5. Current partner characteristics

In Gauteng, 437 women reported having partners (i.e. being in a relationship of some sort); and about 70% of these women had partners 30 years or older compared to about 64% in the Western Cape, p =0.061 (Table 5). The Gauteng respondents reported that 100% of their partners completed Grade 8 or lower education compared to about 63 % in the Western Cape, p < 0.001 (Table 5). The current employment rate for the women's partners was lower (78.3%) in Gauteng compared to the Western Cape (95.7%), p < 0.001 (Table 5). The minority (about 9%) of women in Gauteng were satisfied with their partners, compared to the majority (95%) in the Western Cape, p< 0.001 (Table 5). A smaller percentage of women in urban Gauteng had serious disagreements (54%, p=0.041) or physical fights (13.4%, p<0.001) with their partners compared to their rural counterparts in the Western Cape, where 61.8% had serious disagreements and 37% had physical fights with their partners (Table 5). The majority of women in the Western Cape reported having control in their relationships (69.7%,

p<0.001) and trusting their partners (92.4%, p<0.001), compared to only 19% of women having control in their relationships and only 15.4% trusting their partners in Gauteng (Table 5). Interestingly, 100% of the women in Gauteng reported that their partners did not binge drink, compared to 54.4 % in the Western Cape (Table 5). In other words, nearly half (45.6%) of the women in the Western Cape reported that their partners binge drink, compared to none in Gauteng, p<0.001. Overall, there were statistically significance differences in almost all of the measured partner characteristics variables between the rural and urban sites (Table 5).

Table 5: Comparison of current partner characteristics

Variable	Urban site: Gauteng (n=606)	Rural Site: W. Cape (n=412)	p-value[a]
Age of current partner			
≥ 30 years	309 (70.71%)	205 (64.25%)	0.061
< 30 years	128 (29.29%)	114 (35.74%)	
Education			
≤ Grade 8	438 (100 %)	194 (62.78%)	**<0.001***
> Grade 8	0 (0.00%)	115 (37.22%)	
Currently employed			
No	100 (21.74%)	14 (4.27%)	**<0.001***
Yes	360 (78.26%)	314 (95.73%)	
Satisfied with partner			
No	416 (91.03%)	16 (4.88%)	**<0.001***
Yes	41 (8.97%)	312 (95.12%)	
Serious disagreements with partner at times			**0.041**
No	205 (45.56%)	125 (38.23%)	
Yes	245 (54.44%)	202 (61.77%)	
Physical fighting with partner at times			
No	389 (86.64%)	206 (63.00%)	**<0.001***
Yes	60 (13.36%)	121 (37.00%)	
Have control in relationship			
No	360 (80.72%)	99 (30.28%)	**<0.001***
Yes	86 (19.28%)	228 (69.72%)	
Trust in relationship			
No	380 (84.63%)	25 (7.65%)	**<0.001***
Yes	69 (15.37%)	302 (92.35%)	
Binge drinking partner[b]			
No	430 (100%)	178 (54.43%)	**<0.001***
Yes	0 (0.00%)	149 (45.57%)	
Feel obliged to drink with partner			
No	422 (96.35%)	282 (86.50%)	**<0.001***
Yes	16 (3.65%)	44 (13.50%)	

[a]P-value <0.05 denotes significant statistical differences in the respective variables between the urban and rural site.

[b]Binge drinking is defined as consumption of more than five drinks per day for males and more than three drinks per day for females

***Remained statistically significant after Bonferroni correction (p≤0.005).

3.1.6. Community and social support variables

In Gauteng, around 30% of the women agreed that there were many recreational facilities in their communities and that it was easy to use the facilities, compared to around 19% in the rural Western Cape, p<0.001 (Table 6). The majority (82.2%) of women in urban Gauteng agreed that it was easy to buy alcohol in the community, compared to only 31.3% in the rural Western Cape, p<0.001 (Table 6). In Gauteng, 82.3% of women agreed that a lot of people drink heavily in their communities and 57.3% agreed that the community accepts abuse of alcohol, compared to 76% (p=0.017) and 48.5% (p=0.006) respectively, in the rural Western Cape (Table 6). About 60.5% and 68.8% of the women in Gauteng agreed that they have helpful neighbours and a close-knit community respectively, compared to 78.2% (p<0.001) and 94.2% (p<0.001) respectively, in the rural Western Cape (Table 6). A similar percentage (72.9 ± 1.2%) of women in urban Gauteng and the rural Western Cape reported having strong social capital, p=0.55 (Table 6).

Table 6: Comparison of community variables and social support

Variable	Urban site: Gauteng (n= 606)	Rural Site: W. Cape (n = 412)	p-value[a]
Availability of many recreational facilities in the community			
Agree	202 (33.33%)	77 (18.69%)	**< 0.001***
Easy to use recreational facilities			
Agree	194 (32.01%)	82 (19.90%)	**< 0.001***
Easy to buy alcohol in the community			
Agree	498 (82.18%)	129 (31.31%	**< 0.001***
Significant heavy drinking in the community			
Agree	499 (82.34%)	314 (76.12%)	**0.017**
Community accepts abuse of alcohol			
Agree	347 (57.26%)	200 (48.54%)	**0.006***
Helpful neighbours			
Agree	367 (60.56%)	322 (78.16%)	**< 0.001***
Close-knit community			
Agree	417 (68.81%)	388 (94.17%)	**<0.001***
Social support			
Strong social capital	447 (73.76%)	297 (72.09%)	0.554

[a]P-value <0.05 denotes significant statistical differences in the respective variables between the urban and rural site.

***Remained statistically significant after Bonferroni correction (p≤0.006).

3.1.7. General health, contraceptive use and pregnancy variables

There was no significant statistical difference (p>0.05) in general health, lifetime contraceptive use and lifetime miscarriage among women between the two study sites (Table 7). However, there was statistical significant difference (p<0.005) in current and effective use of contraceptive and parity respectively among the women between the urban Gauteng and the rural Western Cape (Table 7).

Table 7: Comparison of variables for general health, contraceptive use and pregnancy

Variable	Urban site: Gauteng (n = 606)	Rural Site: W. Cape (n =412)	p-value[a]
General Health			
Good	493 (81.35%)	329 (79.85%)	0.552
Contraceptive use			
Lifetime use[b]	354 (57.84%)	213 (52.46%)	0.057
Current use	310 (51.15%)	185 (44.90%)	**0.042**
Effective use[c]	308 (50.83%)	185 (44.90%)	**0.031**
Parity			
Yes	460 (75.91%)	354 (85.92%)	**< 0.001***
Miscarriage			
Lifetime	103 (17.00%)	81 (19.66%)	0.270

[a]P-value <0.05 denotes significant statistical differences in the respective variables between the urban and rural site.

[b]Lifetime contraceptive use means having ever used anything in any way to delay or avoid getting pregnant.

[c]Effective contraceptive means using any method, which has been empirically shown to be effective in preventing pregnancy such as a pill, intrauterine device (IUD),injections, diaphragm, condom, female sterilisation, male sterilization or abstinence.

***Remained statistically significant after Bonferroni correction (p≤0.008).

3.1.8. Sexual behaviour variables

In urban Gauteng, 528/571 (92.5%) women who responded to the question reported lifetime sexual activity compared to 385/394 (97.7%) women in the rural Western Cape, p<0.001 (**Table 8**). A significantly lower percentage (38.7%) of women in urban Gauteng reported having had sex for the first time when they were below the age of 18 years, compared to 50.6% in the rural Western Cape, p<0.001 (**Table 8**). The majority of women in both urban Gauteng (94.2%) and the rural Western Cape (91.7%) reported that their most recent sex partner was their husband or boyfriend, p<0.001 (**Table 8**). Notwithstanding, a significantly higher proportion of women in the urban Gauteng (14.7%) compared to the rural Western Cape (4.4%) reported

having had more than one sexual partner (multiple sex partners) in the last 3 months, p<0.001 (**Table 8**). However, consistent use of condom with causal or regular partner was lower among women from the rural Western Cape (4 - 4.5 %) compared to 17.7-24.3% in urban Gauteng, p<0.001 (**Table 8**). Thus, 68.32% of Gauteng women and 81.80% of Western Cape women (p<0.001) had unprotected sex (**Table 8**). In addition, compared to the rural Western Cape women, significantly higher percentages of women in urban Gauteng reported that is was easy to buy or get free condoms and that it was important to use a condom with spouse/regular partner, p<0.001 (**Table 8**). In general, the rural Western Cape had a significantly higher percentage (82.5%) of women with combined risky sexual behaviour compared to urban Gauteng (70.1%), p<0.001 (**Table 8**). Overall, women from the two sites had significantly different sexual behaviour variables.

Table 8: Comparison of variables for sexual behaviour

Variable	Urban site: Gauteng (n =606)	Rural Site: W. Cape (n=412)	p-value[a]
Sexual activity			
Lifetime	528/571 (92.47%)	385/394 (97.72%)	**<0.001***
Age of sex debut			
< 18 years	204/527 (38.71%)	191/377 (50.66%)	**< 0.001***
≥18 years	323/527 (61.29%)	186/377 (49.34%)	
The most recent sex partner			
Husband/boyfriend	505/532 (94.92%)	353/385 (91.69%)	**0.049**
Other[b]	27/532 (5.08%)	32/385 (8.31%)	
Number of sex partners in the past 3 months			
1	453/531 (85.31%)	369/386 (95.60%)	**<0.001***
> 1	78/531 (14.69%)	17/386 (4.40%)	
Sex under alcohol influence in the past 3 months			
None	472/513 (92.01%)	361/386 (93.52%)	0.388
At least once	41/513 (7.99%)	25/386 (6.48%)	
Use of condom with spouse/regular partner			
Always	120/494 (24.29%)	13/323 (4.02%)	**<0.001***
Use of condom with casual partner			
Always	45/254 (17.72%)	8/179 (4.47%)	**<0.001***
Condom use in the most recent sex act			
Yes	187/506 (36.96%)	23/317 (7.26%)	**<0.001***
Ease of buying condoms in the community			
Easy	419/576 (72.74%)	139/392 (35.56%)	**< 0.001***
Ease of getting free condoms			
Easy	576/588 (97.96%)	322/398 (80.90%)	**<0.001***
Importance of condom use with spouse/regular partner			
Important	430/584 (73.63%)	137/398 (34.42%)	**<0.001***
Importance of condom use with casual partner			
Important	557/589 (94.57%)	367/397 (92.44%)	0.178
Multiple sex partners	78/531 (14.69%)	17/386 (4.40%)	**<0.001***
Unprotected sex	414/606 (68.32%)	337/412 (81.80%)	**<0.001***
Combined risky sexual behaviour[c]	425/606 (70.13%)	340/412 (82.52%)	**<0.001***
Yes			

[a]P-value <0.05 denotes significant statistical differences in the respective variables between the urban and rural site.

[b]Other included extramarital or regular partner other than a boyfriend, ex-husband or ex-boyfriend, causal acquaintance or someone just met.

[c]Having more than one sexual partner in the past three months, or not always using a condom with a casual or regular partner in the past three months, or not having used a condom in the most recent sex act.

*Remained statistically significant after Bonferroni correction (p≤0.003).

3.2. Variables associated with risky sexual behaviour

To determine which independent variables and possible confounders were significantly ($p<0.05$) associated with multiple partners, unprotected sex or combined risky sexual behaviour (i.e. multiple partners and/or unprotected sex) among women from the urban Gauteng and the rural Western Cape, respectively, bivariate χ^2–test analysis using two way frequency tables was performed. A univariate logistic regression analysis was used to confirm and determine the strength of association (odds ratio) of independent variables or possible confounders significantly ($p<0.05$) associated with the dependent variables in the bivariate χ^2–test.

3.2.1. Alcohol/other substance use and risky sexual behaviour

In Gauteng, binge drinking ($p = 0.010$); risk drinking ($p < 0.001$) and alcohol dependence ($p = 0.018$) were positively associated with multiple sex partners, respectively (Table 9). On the other hand, regular smoking ($p = 0.03$) was negatively associated with multiple partners (Table 9). The univariate logistic regression analysis showed that the urban Gauteng women who binge drink (OR = 2.17±0.66; 95% CI = 1.19–3.34, $p < 0.001$), risk drink (OR = 3.77±1.28; 95% CI = 1.94–7.34, $p < 0.001$) or dependent on alcohol (OR = 2.31±0.83; 95% CI = 1.14–4.71, $p = 0.021$) were at least twice likely to have multiple partners compared those who did not. In contrast, the univariate logistic regression analysis showed that the urban Gauteng women who were regular smokers (OR = 0.08±0.09; 95% CI 0.01–0.72, $p = 0.024$) had the risk of having multiple partners reduced by at least 83% compared to those who did not.

In the rural Western Cape women, lifetime alcohol use ($p = 0.048$) was the only independent variable related to alcohol or other substance that had statistically

significant negative association with multiple sex partners (Table 9). All the other alcohol or substance use related variables had no statistically significant positive or negative association with multiple sex partners (Table 9). The univariate logistic regression analysis showed that the rural Western Cape women who have had alcohol in their lifetime (OR = 0.38±.019; 95% CI 0.14–1.02; p = 0.05) had the risk of having multiple sex partners reduced by about 60% compared to those who did not.

Table 9: Association of alcohol/other substance use and multiple sex partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Lifetime alcohol use		0.446		**0.048**
No	51/326 (15.64%)		8/102 (7.84%)	
Yes	27/204 (13.24%)		9/284 (3.17%)	
Current use		0.158		0.511
No	53/395 (13.42%)		10/197 (5.08%)	
Yes	25/136 (18.38%)		7/189 (3.70%)	
Binge drinking		**0.010***		0.691
No	60/458 (13.10%)		1/38 (2.63%)	
Yes	18/73 (24.66%)		6/150 (4.00%)	
Risk drinking		**<0.001***		0.097
No	62/486 (12.76%)		0/50 (0.00%)	
Yes	16/45 (35.56%)		7/132 (5.30%)	
Alcohol dependent		**0.018**		0.285
No	66/486 (13.58%)		0/26 (0.00%)	
Yes	12/45(26.67%)		7/165(4.24%)	
Alcohol onset age		0.968		0.620
Minor (<18yrs)	20/151 (13.25%)		6/166 (3.61%)	
≥18 yrs	7/52 (13.46%)		3/117 (2.56%)	
Lifetime cigarette use		0.382		0.294
No	67/436 (15.37%)		7/115 (6.09%)	
Yes	11/93 (62.61%)		10/271 (3.69%)	
Regular smoker		**0.030**		0.598
No	10/49 (20.41%)		5/86 (5.81%)	
Yes	1/45 (2.22%)		6/185 (3.24%)	
Current smoker		0.514		0.326
No	6/36 (16.67%)		0/25 (0.00%)	
Yes	6/51 (11.76%)		9/241 (3.73%)	
Lifetime use: other drugs		0.368		0.973
No	76/507 (14.99%)		16/364(4.40%)	
Yes	2/24 (8.33%)		1/22 (4.55%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

***Remained statistically significant after Bonferroni correction (p≤0.0125).

Interestingly, lifetime alcohol use (p = 0.016); current alcohol use (p = 0.018) and binge drinking (p = 0.009) were negatively associated with unprotected sex in the urban Gauteng women, respectively (Table 10). Thus the univariate logistic regression

analysis showed that in urban Gauteng, women who have had alcohol in their lifetime (OR = 0.65±0.11; 95% CI = 0.46–0.92; p = 0.016), current drinkers (OR = 0.64±0.121; 95% CI = 0.44–0.93, p = 0.019) or binge drinkers (OR = 0.54±0.12; 95% CI = 0.34–0.86; p = 0.01) have the risk of having unprotected sex reduced by between 35-50% compared to those who did not. However, the rural Western Cape women who were current users of alcohol had a statistically significant (p = 0.026) higher risk of having unprotected sex compared to those who did not (Table 10). Using univariate logistic regression analysis, the rural Western Cape women who were currently using alcohol were twice at higher risk (OR= 1.79±0.47, 95% CI= 1.06–3.00, p = 0.028) of having unprotected sex compared to those who did not currently use alcohol.

Table 10: Association of alcohol/other substance use and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Lifetime alcohol use		**0.016***		0.075
No	260/361 (72.02%)		87/114 (76.32%)	
Yes	153/244 (62.70%)		251/298 (84.23%)	
Current use		**0.018**		**0.026**
No	310/436 (71.10%)		168/216 (77.78%)	
Yes	104/170 (61.18%)		169/196 (86.22%)	
Binge drinking		**0.009***		0.237
No	365/519 (70.33%)		33/41 (80.49%)	
Yes	49/87 (56.32%)		135/154 (87.66%)	
Risk drinking		0.056		0.131
No	377/560 (67.32%)		43/54 (79.63%)	
Yes	37/46 (80.43%		119/135 (88.15%)	
Alcohol dependent		0.559		0.681
No	378/556 (67.99%)		24/27 (88.89%)	
Yes	36/50 (72.00%)		147/171 (86.96%)	
Alcohol onset age		0.968		0.620
Minor (<18yrs)	20/151 (13.25%)		6/166 (3.61%)	
≥18 yrs	7/52 (13.46%)		3/117 (2.56%)	
Lifetime cigarette use		0.100		0.238
No	340/488 (69.67%)		98/125 (78.40%)	
Yes	71/115 (61.74%)		239/287 (83.28%)	
Regular smoker		0.216		0.289
No	35/60 (58.33%)		71/88 (80.68%)	
Yes	40/56 (71.43%)		168/198 (84.85%)	
Current smoker		0.633		0.531
No	29/45 (64.44%)		22/25 (88.00%)	
Yes	42/61 (68.85%)		212/255 (83.14%)	
Lifetime use: other drugs		0.280		0.255
No	393/579 (67.88%)		317/390 (81.28%)	
Yes	21/27 (77.78%)		20/22 (90.91%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

***Remained statistically significant after Bonferroni correction (p≤0.016).

Combining the multiple sex partners and unprotected sex variables into a single risky sexual behaviour variable, slightly changed the association with the respective alcohol consumption independent variables. In Gauteng, lifetime alcohol use (p=0.019), current alcohol use (p=0.043), binge drinking (p=0.042) and alcohol onset age of less than 18 years (p=0.032) were negatively associated with combined risky sexual behaviour, respectively; while only risk drinking (p=0.024) was positively associated with combined risky sexual behaviour (Table 11). In the rural Western Cape, only current alcohol use (p=0.032) was positively associated with risky sexual behaviour (Table 11).

Univariant logistic regression analysis confirmed that lifetime alcohol use (OR= 0.66±0.11; 95% CI=0.46–0.93; p=0.02), current alcohol use (OR=0.67±0.13; 95% CI=0.46–0.98; p=0.04), binge drinking (OR=0.61±0.15; 95% CI=0.38-0.98, p=0.04) and alcohol onset age of less than 18 years old (OR=0.53±0.15; 95% CI=0.30–0.95; p=0.03) were respectively between 33-47% protective for combined risky sexual behaviour in the urban Gauteng women. However, the urban Gauteng women who reported risk drinking (OR=2.51±1.05; 95% CI=1.10-5.73; p=0.029) had double the risk for combined risky sexual behaviour compared to those who did not. In the rural Western Cape women, current drinking increased the risk for combined risky sexual behaviour by nearly two (OR=1.77±0.47, 95% CI=1.04–2.99; p=0.03).

Table 11: Association of alcohol/other substance use and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Lifetime alcohol use		**0.019**		0.141
No	266/361 (73.68%)		89/114 (78.07%)	
Yes	158/244 (64.75%)		251/298 (84.23%)	
Current use		**0.043**		**0.032**
No	316/436 (71.68%)		170/216 (78.70%)	
Yes	109/170 (64.21%)		170/196 (86.73%)	
Binge drinking		**0.042**		0.190
No	372/519 (71.68%)		33/41 (80.49%)	
Yes	53/87 (60.92%)		136/154 (88.31%)	
Risk drinking		**0.024**		0.095
No	386/560 (68.93%)		43/54 (79.63%)	
Yes	39/46 (84.78%)		120/135 (88.89%)	
Alcohol dependent		0.344		0.738
No	387/556 (69.60%)		24/27 (88.89%)	
Yes	38/50 (76.00%)		148/171 (86.55%)	
Alcohol onset age		**0.032**		0.680
Minor (<18yrs)	38/70 (54.29%)		106/124 (85.48%)	
≥18 yrs	119/173 (68.79%)		144/172 (83.72%)	
Lifetime cigarette use		0.055		0.373
No	350/488 (71.72%)		100/125 (80.00%)	
Yes	72/115 (62.61%)		240/287 (83.62%)	
Regular smoker		0.118		0.389
No	35/60 (58.33%)		72/88 (81.82%)	
Yes	40/56 (71.43%)		168/198 (84.85%)	
Current smoker		0.633		0.561
No	29/45 (64.44%)		22/25(88.00%)	
Yes	42/61 (68.85%)		213/255 (83.53%)	
Lifetime use: other drugs		0.375		0.287
No	404/579 (69.78%)		320/390 (82.05%)	
Yes	21/27 (77.78%)		20/22 (90.91%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

*****Remained statistically significant after Bonferroni correction (p≤0.01).

3.2.2. Demographic variables and risky sexual behaviour

In Gauteng, having an indigenous first language (p=0.01) and being Black/African (p=0.01) had a statistically significant positive association with multiple sex partners (Table 12). In the Western Cape, being Black/African (p<0.001) also had a statistically significant positive association with multiple sex partners (Table 12).

Table 12: Association of demographic variables and multiple partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age (years)		0.995		0.088
18−24	22/149 (14.7%)		8/96 (8.3%)	
25−34	30/207(14.5%)		4/152 (2.6%)	
35−44	26/175 (14.7%)		5/138 (3.6%)	
Education		ND[c]		0.973
Primary or lower	78/530 (14.72%)		10/228 (4.4 %)	
Secondary and above	ND[c]		7/157 (4.5 %)	
Marital status		0.786		0.524
Legally married	31/206 (15.1 %)		3/111 (2.7%)	
Traditionally married	46/324 (14.2%)		0/4 (0.0%)	
Cohabiting	ND[d]		5/141 (3.5%)	
Never married	ND[d]		8/113 (7.1%)	
Divorced/separated/Widow	ND[d]		1/17 (5.9%)	
First language		**0.010***		0.204
English	2/17 (11.8%)		0/2 (0%)	
Afrikaans	1/67 (1.5%)		14/357 (3.9%)	
One of the South African indigenous languages	74/436 (17%)		3/27 (11.1%)	
Other	1/9 (11.1%)		–	
Racial Classification		**0.001***		**<0.001***
Black/African	77/449 (17.15%)		4/35 (11.4%)	
Coloured	1/46 (2.17%)		12/347 (3.5%)	
White	0/34 (0.0%)		0/3 (0%)	
Asian/Indian	0 (0.0 %)		1/1 (100 %)	

[a]Proportion of respondents with multiple partners

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

[c]Could not be determined (ND) because of the unitary response as per definition of the variable, i.e. all the respondents had primary or lower education.

[d]Not determined because all the respondents were either traditionally or legally married.

*Remained statistically significant after Bonferroni correction (p≤0.01).

The urban Gauteng women who were over 24 years old (p<0.001), legally married (p<0.001) or speak any of the indigenous languages (p=0.043) had a higher risk of having unprotected sex, respectively (Table 13). Univariate logistic regression analysis showed that the urban Gauteng women aged 25-34 years (OR 2.48±0.53; 95% CI=1.63–3.76; p<0.001) and 35-44 years (OR=2.53±0.56; 95% CI=1.64–3.92; p <0.001) were twice likely to have unprotected sex compared to those who were aged 18-24 years. However; those urban Gauteng women who were traditionally married had lower risk of having unprotected sex (OR=0.26±0.05; 95% CI=0.17-0.39; p<0.001) compared to those were legally married. In the rural Western Cape, those women who were cohabitating (OR=2.47±0.97; 95% CI=2.29-0.022; p=0.022) had higher risk and those who were never married (OR=0.51±0.15; 95% CI=0.27–0.93, p=0.03) had lower risk of having unprotected sex compared tho those who were legally married.

Table 13: Association of demographic variables and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age (years)		**<0.001***		0.739
18−24	98/182 (53.85%)		85/102(83.33%)	
25−34	171/230(74.35%)		133/161 (82.61%)	
35−44	145/194(74.74%)		119/149 (79.87%)	
Education		ND[c]		0.692
Primary or lower	413/604 (68.4%)		201/244 (82.38 %)	
Secondary and above	ND[c]		135/167(80.84 %)	
Marital status		**<0.001***		**<0.001***
Legally married	187/221 (84.62 %)		102/123 (82.93%)	
Traditionally married	226/384 (58.85%)		3/4 (75.00%)	
Cohabiting	ND[d]		132/143 (92.31%)	
Never married	ND[d]		89/125 (71.20%)	
Divorced/separated/Widow	ND[d]		11/17 (64.71%)	
First language		**0.043**		0.457
English	15/20 (75%)		1/2 (50.00%)	
Afrikaans	57/96 (59.38%)		313/383 (81.72%)	
One of the South African indigenous languages	335/474 (70.68%)		23/27 (85.19%)	
Other	6/13 (46.15%)		–	
Racial Classification		0.110		0.136
Black/African	345/491 (70.26%)		30/35 (85.71%)	
Coloured	41/67 (61.19%)		304/373 (81.40%)	
White	27/45 (60.00%)		3/3 (100%)	
Asian/Indian	0/1 (0.0 %)		0/1 (0.00 %)	

[a]Proportion of respondents with multiple partners

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

[c]Could not be determined (ND) because of the unitary response as per definition of the variable, i.e. all the respondents had primary or lower education.

[d]Not determined because all the respondents were either traditionally or legally married.

***Remained statistically significant after Bonferroni correction (p≤0.016).

Consolidating multiple sex partners and unprotected sex into a combined sexual risk variable did not alter the direction or strength of association with the demographic variables. For instance, the urban Gauteng, women who were between 25-34 years (OR= 2.38; 95% CI = 1.56-3.63; p< 0.001) and 35-44 years (OR=2.47; 95% CI=1.58-3.84, p<0.001) were still more than twice likely to have a combined risky sexual behaviour compared to those who were 18-24 years old (Table 14). Furthermore, the urban Gauteng women who were traditionally married still had lower risk of having a combined risky sexual behaviour (OR=0.28; 95% CI=0.18-0.42, p<0.001) compared to those were legally married (Table 14). In the rural Western Cape, those women who were cohabitating were still more than twice likely (OR= 2.33; 95% CI = 0.05-5.08; p=0.03) to have a risky sexual behaviour compared to those who were legally married; and those who never married were still nearly 50% less likely (OR= 0.52; 95% CI = 0.27-0.96; p=0.04) to have a combined risky sexual behaviour compared to those who were legally married (Table 14).

Table 14: Association of demographic variables and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age (years)		**<0.001***		0.621
18−24	103/182 (56.59%)		87/102 (85.29%)	
25−34	174/230 (75.65%)		133/161 (82.61%)	
35−44	148/194 (76.29%)		120/149 (80.54%)	
Education		ND[c]		0.645
Primary or lower	424/604 (70.20%)		203/244 (83.20 %)	
Secondary and above	ND[c]		136/167 (81.44 %)	
Marital status		**<0.001***		**<0.001***
Legally married	188/221 (85.07 %)		103/123 (83.74%)	
Traditionally married	236/384 (61.46)		3 out of 4 (75%)	
Cohabiting	ND[d]		132/143 (92.31%)	
Never married	ND[d]		91/125 (72.80%)	
Divorced/separated/Widow	ND[d]		11/17 (64.71%)	
First language		**0.010***		0.449
English	16/20 (80.00%)		½ (50%)	
Afrikaans	57/96 (59.38%)		316/383 (82.51%)	
One of the South African native languages	345/474 (72.48%)		23/27 (85.19%)	
Other	6/13 (46.15%)		–	
Racial Classification		**0.038**		0.764
Black/African	356/491 (72.51%)		30/35 (85.71%)	
Coloured	41/67 (61.19%)		306/373 (82.04%)	
White	27/45 (60.00%)		3/3 (100%)	
Asian/Indian	0/1 (0.00%)		1/1 (100 %)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association. *Remained statistically significant after Bonferroni correction (p≤0.0125).

[c]Could not be determined (ND) because of the unitary response as per definition of the variable, i.e. all the respondents had primary or lower education.

[d]Not determined because all the respondents were either traditionally or legally married.

3.2.3. Socio-economic/household hunger and risky sexual behaviour

In the urban Gauteng, unemployment was positively associated with multiple sex partners (Table 15). Univariate logistic regression analysis showed that women who were working had a lower risk (OR=0.64±0.12; 95% CI=0.28–0.91; p =0.023) of having multiple sex partners compared to those who were not working. In the rural Western Cape, household hunger was positively associated with multiple sex partners (Table 15). Thus, women who reported household hunger had higher risk (OR=2.92±1.62; 95% CI=0.98–8.68; p=0.05) of having multiple sex partners compared to those who did not.

Table 15: Association of socio-economic/household hunger and multiple sex partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Paid work done in the last 12 months		0.086		0.980
No	49/286 (17.13%)		3/69 (4.35%)	
Yes	29/245 (11.84%)		14/317 (4.42%)	
Employment status		**0.023**		0.785
Not working	51/306 (16.67%)		3/79(3.80%)	
Working	17/183 (9.29%)		10/221 (4.52%)	
Socio-economic status		0.976		0.623
Low SES	27/183 (14.75%)		12/251 (4.78%)	
High SES	51/348 (14.66%)		5/135 (3.70%)	
Household hunger		0.557		**0.044**
No	78/529 (14.74%)		12/335 (3.58%)	
Yes	0/2 (0.00%)		5/51 (9.80%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
*****Remained statistically significant after Bonferroni correction (p≤0.0125).

While in the Western Cape household hunger was also positively associated with unprotected sex; in Gauteng only low socio-economic status was positively associated with unprotected sex (Table 16). In the rural Western Cape, women who reported household hunger were more than twice likely (OR=2.87±1.54; 95% CI=1.00–8.25; p=0.049) to have unprotected sex compared to those who did not. On the other hand, in

the urban Gauteng, women who were of high socio-economic status had the risk of having unprotected sex reduced by at least 24% (OR=0.64±0.12; 95% CI=0.44–0.93; p=0.022) compared to those who were of low socio-economic status.

Table 16: Association of socio-economic/household hunger and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Paid work done in the last 12 months		0.597		0.400
No	223/322 (69.25%)		58/74 (78.38%)	
Yes	191/284 (67.25%)		281/338 (83.14%)	
Employment status		0.565		0.696
Not working	237/345 (68.70%)		69/85 (81.18%)	
Working	142/214 (66.36%)		196/236 (83.05%)	
Socio-economic status		**0.022**		0.445
Low SES	149/200 (74.50%)		218/263 (82.89%)	
High SES	265/406 (65.27%).		119/149 (79.87%)	
Household hunger		0.355		**0.041**
No	412/604 (68.21%)		290/361 (80.33%)	
Yes	2/2 (100 %)		47/51 (92.16%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
*****Remained statistically significant after Bonferroni correction (p≤0.005).

Combined risky sexual behaviour had very similar outcomes as unprotected sex in both Gauteng and the Western Cape. In Gauteng, high SES was negatively associated and hence protective (OR=0.65; 95% CI = 0.44-0.95; p=0.027) for combined risky sexual behaviour (Table 17). In the Western Cape, household hunger was positively associated and hence a risk factor (OR=5.89; 95% CI = 1.39-24.81; p=0.016) for risky sexual behaviour (Table 17).

Table 17: Association of socio-economic/household hunger and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Paid work done in the last 12 months		0.458		0.485
No	230/322 (71.43%)		59/74 (79.73%)	
Yes	195/284 (68.66%)		281/338 (83.14%)	
Employment status		0.352		0.813
Not working	245/345 (71.01%)		70/85 (82.35%)	
Working	144/214 (67.29%)		197/236 (83.47%)	
Socio-economic status		**0.027**		0.285
Low SES	152/200 (76%)		221/263 (84.03%)	
High SES	273/406 (67.24%).		119/149 (79.87%)	
Household hunger		0.355		**0.006**
No	423/604 (70.03%)		291/361 (80.61%)	
Yes	2/2 (100 %)		49/51 (96.08%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
*****Remained statistically significant after Bonferroni correction (p≤0.005).

3.2.4. Psycho-social variables and risky sexual behaviour

The urban Gauteng women who had high religiosity (p=0.030) or disagreed with the statement that "children are a sign of a worthy woman" had reduced risk of having multiple sex partners, respectively (Table 18). Thus, univariate logistic regression analysis showed that the Gauteng women with high religiosity had the risk of having of having multiple sex partners reduced by at least 30% (OR=0.55±0.15; 95% CI=0.32–0.95; p=0.032) compared to those with low religiosity. Those who agreed with the statement that "children are a sign of a worthy woman" had the risk of having multiple partners doubled (OR=2.2±0.67; 95% CI=1.21–4.00, p=0.009).

Interestingly, none of the psycho-social variables had statistically significant association with unprotected sex and the combined risky sexual behaviour among the respondents from both urban Gauteng and the rural Western Cape (Table 19 and Table 20).

Table 18: Association of psycho-social variables and multiple partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Self-esteem		0.198		0.086
Low	27/219 (12.33%)		2/15 (13.33%)	
High	51/312 (16.35%)		15/371 (4.04%)	
Religiosity		**0.030**		0.495
Low	24/114 (21.05%)		3/95 (3.16%)	
High	54/417 (12.95%)		14/291 (4.81%)	
Male fertility entitlement[a]		0.123		0.677
Disagree	41/321 (12.77%)		12/289 (4.15%)	
Agree	37/210 (17.62%)		5/97 (5.15%)	
Child bearing perception		0.068		0.186
Childless choice is wrong	37/302 (12.25%)		9/261 (3.45%)	
Childless choice is right	41/229 (17.90%)		8/125 (6.40%)	
Children are a sign of a worthy woman		**0.008***		0.261
Disagree	15/171 (8.77%)		1/60 (1.67%)	
Agree	63/360 (17.50%)		16/326 (4.91%)	
Children are a sign of a worthy man		0.120		0.533
Disagree	21/184 (11.41%)		2/67 (2.99%)	
Agree	57/347 (16.43%)		15/319 (4.70%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
*****Remained statistically significant after Bonferroni correction (p≤0.008).

Table 19: Association of psycho-social variables and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Self-esteem		0.298		0.387
Low	169/256 (66.02%)		11/15 (73.33%)	
High	245/350 (70.00%)		326/397 (82.12%)	
Religiosity		0.781		0.720
Low	86/124(69.35%)		83/100 (83.00%)	
High	328/482 (68.05%)		254/312 (81.41%)	
Male fertility entitlement[a]		0.568		0.677
Disagree	258/373 (69.17%)		12/289 (4.15%)	
Agree	156/233 (66.95%)		5/97 (5.15%)	
Child bearing perception		0.830		0.611
Childless choice is wrong	242/356 (67.98%)		226/274 (82.48%)	
Childless choice is right	172/250 (68.80%)		111/138 (80.43%)	
Children are a sign of a worthy woman		0.120		0.542
Disagree	135/210 (64.29%)		56/70 (80.00%)	
Agree	279/396 (70.45%)		284/342 (83.04%)	
Children are a sign of a worthy man		0.102		0.701
Disagree	144/224 (64.29%)		61/76 (80.26%)	
Agree	270/382 (70.68%)		276/336 (82.14%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

Table 20: Association of psycho-social variables and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Self-esteem		0.240		0.793
Low	173/256 (67.58%)		12/15 (80%)	
High	252/350 (72.00%)		328/397 (82.62%)	
Religiosity		0.504		0.886
Low	90/124 (72.58%)		83/100 (83.00%)	
High	335/482 (69.50%)		257/312 (82.37%)	
Male fertility entitlement[a]		0.797		0.150
Disagree	263/373 (70.51%)		259/308 (84.09%)	
Agree	162/233 (69.53%)		81/104 (77.88%)	
Child bearing perception		0.508		0.974
Childless choice is wrong	246/356 (69.10%)		226/274 (82.48%)	
Childless choice is right	179/250 (71.60%)		114/138 (82.61%)	
Children are a sign of a worthy woman		0.084		0.542
Disagree	138/210 (65.71%)		56/70 (80.00%)	
Agree	287/396 (72.47%)		284/342 (83.04%)	
Children are a sign of a worthy man		0.063		0.565
Disagree	147/224 (65.63%)		61/76 (80.26%)	
Agree	278/382 (72.77%)		279/336 (83.04%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

3.2.5. Partner characteristics and risky sexual behaviour

In Gauteng, women who had working partners (p=0.004) or did not trust their partners (p=0037) had lower risk of having multiple sex partners, respectively (Table 21). Univariate logistic regression analysis showed that the Gauteng women with working partners were less likely (OR=0.43±0.12; 95% CI=0.24–0.77; p =0.005) to have multiple sex partners compared to those who did. Those Gauteng women who trusted their partners were almost twice likely (OR=1.99±0.66; 95% CI=1.03–3.82; p=0.04) to have multiple sex partners compared to those who did. In contrast, in the rural Western Cape, women who trusted their partners were less likely (OR=0.16±0.10; 95% CI=0.047–0.58, p=0.005) to have multiple sex partners compared to those who did not.

Table 21: Association of partner characteristics and multiple partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age of current partner		0.614		0.315
< 30 years	15/118 (12.71%)		6/113 (5.31%)	
≥ 30 years	43/294(14.63%)		6/198 (3.03%)	
Education		ND[c]		0.141
≤ Grade 8	57/411 (13.87%)		10/191 (5.24%)	
> Grade 8	ND[c]		2/111 (1.80%)	
Currently employed		**0.004***		0.431
No	22/95(23.16%)		0/14 (0.00%)	
Yes	39/337 (11.57%)		13/306 (4.25%)	
Satisfied with partner		0.249		0.079
No	52/389 (13.37%)		2/16 (12.50%)	
Yes	8/40 (20.00%)		11/304 (3.62%)	
Serious disagreements with partner at times		0.218		0.587
No	32/198 (16.16%)		4/121(3.31%)	
Yes	27/225 (12.00%)		9/198 (4.55%)	
Physical fighting with partner at times		0.367		0.208
No	50/367 (13.62%)		6/200 (3.00%)	
Yes	10/55 (18.18%)		7/119 (5.88%)	
Have control in relationship		0.232		0.997
	50/337 (14.84%)		4/98 (4.08%)	
No	8/82 (9.76%)		9/221 (4.07%)	
Yes				
Trust partner		**0.037**		**0.002***
No	45/355 (12.68%)		4/25 (16.00%)	
Yes	15/67 (22.39%)		9/294 (3.06%)	
Binge drinking partner		ND[d]		0.764
No	57/404 (14.11%)		6/173 (3.47%)	
Yes	ND[d]		6/146(4.11%)	
Feel obliged to drink with partner		0.707		0.745
No	55/397 (13.85%)		10/275 (3.64%)	
Yes	2/14 (14.29%)		2/43 (4.65%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

[c]Could not be determined (ND) because of the unary response as per definition of the variable, i.e. all partners of the respondents had primary (Grade 8) or lower education.

[d]Not determined because of the unary response as per definition of the variable .

***Remained statistically significant after Bonferroni correction ($p \leq 0.025$).

In Gauteng, a partner aged ≥ 30 years (p<0.001) was positively associated with unprotected sex (Table 22). In the Western Cape, women who had currently employed partners (p=0.002) or had serious disagreements with their partners (p=0.042) had a higher risk of having unprotected sex, respectively (Table 22). In Gauteng, women who had partners aged ≥ 30 years old were at least twice as likely (OR=2.77±0.66; 95% CI=1.73–4.43, p=<0.001) to have unprotected sex than those who had partners aged <30 years old. In the Western Cape, women who had currently employed partners (OR=3.78±2.35; 95% CI=1.12–12.81; p=0.032) or had serious disagreement with their partners at times (OR=2.10±0.77; 95% CI=1.01–4.33; p=0.045) had the risk of having unprotected sex increased by 2-3 times compared to those who did not have working partners or did not have serious disagreement with their partners at times, respectively.

The composite risky sexual behaviour variable had similar outcomes as the unprotected sex variable (Table 23). Thus, a partner aged ≥30 years old in Gauteng (p<0.001) and an employed partner in the Western Cape (p=0.015) were positively associated with combined risky sexual behaviour, respectively (Table 23). In Gauteng, women with partners aged ≥30 years old had more than double the odds (OR=2.6±0.65; 95% CI = 1.64-4.29; p< 0.001) to have combined risky sexual behaviour compared to those with partners aged <30 years. In the rural Western Cape, women with a currently employed partner were 4 times more likely (OR=4.08±2.55; 95% CI = 1.2-13.87; p= 0.02) to have a risky sexual behaviour compared to those who did not.

Table 22: Association of partner characteristics and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age of current partner		**<0.001***		0.955
< 30 years	82/128 (64.06%)		102/114 (89.47%)	
≥ 30 years	257/309 (83.17%)		183/205 (89.27%)	
Education		ND[c]		0.127
≤ Grade 8	340/438 (77.63%)		179/194 (92.27%)	
> Grade 8	ND[c]		100/115 (86.96%)	
Currently employed		0.479		**0.022**
No	75/100 (75.00%)		10/14 (71.43%)	
Yes	282/360 (78.33%)		284/314 (90.45%)	
Satisfied with partner		0.204		0.774
No	319/416 (76.68%)		14/16 (87.50%)	
Yes	35/41 (84.37%)		280/312 (89.4%)	
Serious disagreements with partner at times		0.433		**0.042**
No	162/205 (79.02%)		107/125 (85.60%)	
Yes	186/245 (75.92%)		187/202 (92.57%)	
Physical fighting with partner at times		0.383		0.222
No	297/389 (76.35%)		182/206 (88.35%)	
Yes	50/60 (83.33%)		112/121 (92.56%)	
Have control in relationship		0.105		0.426
			91/99 (91.92%)	
No	272/360 (75.56%)		203/228 (89.04%)	
Yes	72/86 (83.72%)			
Trust partner		0.833		0.718
No	293/380 (77.11%)		23/25 (92.00%)	
Yes	54/69 (78.26%)		271/302 (89.74%)	
Binge drinking partner		ND[d]		0853
No	331/430 (76.98%)		160/178 (89.89%)	
Yes	ND[d]		133/149 (89.26%)	
Feel obliged to drink with partner		0.851		0.170
No	325/422 (77.01%)		250/282 (88.65%)	
Yes	12/16 (75.00%)		42/44 (95.45%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

[c]Could not be determined (ND) because of the unary response as per definition of the variable, i.e. all partners of the respondents had primary (Grade 8) or lower education.

[d]Not determined because of the unary response as per definition of the variable .

*****Remained statistically significant after Bonferroni correction (p≤0.005).

Table 23: Association of partner characteristics and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age of current partner		**<0.001***		0.865
< 30 years	86/128 (67.19%)		103/114 (90.35%)	
≥ 30 years	261/309 (84.47%)		184/205 (89.76%)	
Education		ND[c]		0.060
≤ Grade 8	348/438 (79.45%)		181/194 (93.30%)	
> Grade 8	ND[c]		100/115 (86.96%)	
Currently employed		0.707		**0.015**
No	78/100 (78.00%)		10/14 (71.43%)	
Yes	287/360 (79.72%)		286/314 (91.08%)	
Satisfied with partner		0.155		0.628
No	326/416 (78.37%)		15/16 (93.75%)	
Yes	36/41 (87.80%)		281/312 (90.06%)	
Serious disagreements with partner at times		0.373		0.107
No	166/205 (80.98%)		109/125 (87.20%)	
Yes	190/245 (77.55%)		187/202 (92.57%)	
Physical fighting with partner at times		0.383		0.334
No	305/389 (78.41%)		184/206 (89.32%)	
Yes	50/60 (83.33%)		112/121 (92.56%)	
Have control in relationship		0.225		0.569
	280/360 (77.78%)		91/99 (91.92%)	
No	72/86 (83.72%)		205/228 (89.91%)	
Yes				
Trust in relationship		0.432		0.793
No	298/380 (78.42%)		23/25 (92.00%)	
Yes	57/69 (82.61%)		273/302 (90.40%)	
Binge drinking partner		ND[d]		0.876
No	339/430 (78.84%)		161/178 (90.45%)	
Yes	ND[d]		134/149 (89.93%)	
Feel obliged to drink with partner		0.707		0.206
No	333/422 (78.91%)		252/282 (89.36%)	
Yes	12/16 (75.00%)		42/44 (95.45%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

[c]Could not be determined (ND) because of the unary response as per definition of the variable, i.e. all partners of the respondents had primary (Grade 8) or lower education.

[d]Not determined because of the unary response as per definition of the variable .

*****Remained statistically significant after Bonferroni correction (p≤0.005).

3.2.6. Community/social support variables and risky sexual behaviour

In Gauteng, availability of many recreational facilities in the community (p=0.031) or close knit community (p=0.002) were negatively associated with multiple sex partners, respectively (Table 24). In the Western Cape, none of the community/social support

variables has any statistically significant association with multiple sex partners (Table 24). Univaraite logistic regression analysis showed that in Gauteng, women who agreed that they have availability of many recreational facilities in their community (OR=0.544±0.155; 95% CI=0.31–0.95; p=0.033) or had close knit-community (OR=0.46±0.11, 95% CI=0.28–0.75; p=0.002) were less likely to have multiple partners than does who did not.

Table 24: Association of community/social support variables and multiple sex partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Availability of many recreational facilities in the community		**0.031**		0.100
Disagree	60/352 (17.05%)		12/313 (3.83%)	
Agree	18/179 (10.06%)		5/73(6.85%)	
Easy to use recreational facilities		0.055		0.334
Disagree	61/366 (16.67%)		12/308 (3.90%)	
Agree	17/165 (10.30%)		5/78 (6.41%)	
Easy to buy alcohol in the community		0.356		0.806
Disagree	17/96 (17.71%)		12/262 (4.58%)	
Agree	61/435 (14.02%)		5/124 (4.03%)	
Significant heavy drinking in the community		0.441		0.622
Disagree	11/91 (12.09%)		3/87 (3.45%)	
Agree	67/440 (15.23%)		14/299 (4.68%)	
Community accepts abuse of alcohol		0.051		0.511
Disagree	40/219 (18.26%)		10/197 (5.08%)	
Agree	38/12 (12.18%)		7/189 (3.70%)	
Helpful neighbours		0.414		0.835
Disagree	35/216 (16.20%)		4/83 (4.82%)	
Agree	43/315(13.65%)		13/303 (4.29%)	
Close-knit community		**0.002**		0.333
Disagree	37/170 (21.76%)		2/24 (8.33%)	
Agree	41/361 (11.36%)		15/362 (4.14%)	
Social support		0.181		0.814
Weak social capital	14/127 (11.02%)		5/104 (4.81%)	
Strong social capital	64/404 (15.84%)		12/282 (4.26%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

*****Remained statistically significant after Bonferroni correction (p≤0.005).

In Gauteng, women who agreed that there was significant heavy drinking in the community were more likely (OR=1.65±0.36; 95% CI=0.28–0.75; p=0.002) to have unprotected sex than those who did not (Table 25). In the Western Cape, women who agreed that the community accepts abuse of alcohol (OR=1.75±0.46; 95% CI=1.05–2.93; p=0.032), or agreed that they have helpful neighbours (OR=1.93±0.54; 95% CI=1.11–3.33; p=0.019) or agreed that they have close-knit community (OR=2.39±1.08; 95% CI=0.98–5.82; p=0.05), respectively, were at higher risk of having unprotected sex compared to those who did not (Table 25).

Table 25: Association of community/social support variables and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Availability of many recreational facilities in the community		0.578		0.100
Disagree	279/404 (69.06%)		269/335 (80.30%)	
Agree	135/202 (66.83%)		68/77(88.31%)	
Easy to use recreational facilities		0.074		0.115
Disagree	291/412 (70.63%)		265/330 (80.30%)	
Agree	123/194 (63.40%)		72/82 (87.80%)	
Easy to buy alcohol in the community		0.234		0.131
Disagree	79/108 (73.15%)		226/283 (79.86%)	
Agree	335/498 (67.27%)		111/129 (86.05%)	
Significant heavy drinking in the community		**0.021**		0.065
Disagree	63/107 (58.88%)		74/98 (75.51%)	
Agree	351/499 (70.34%)		263/314 (83.76%)	
Community accepts abuse of alcohol		0.079		**0.032**
Disagree	167/259 (64.48%)		165/212 (77.83%)	
Agree	247/347 (71.18%)		172/200 (86.00%)	
Helpful neighbours		0.262		**0.019**
Disagree	157/239 (65.69%)		66/90 (73.33%)	
Agree	257/367 (70.03%)		271/322 (84.16%)	
Close-knit community		0.723		**0.048**
Disagree	131/189 (69.31%)		16/24 (66.67%)	
Agree	283/417 (67.87%)		321/388 (82.73%)	
Social support		0.189		0.582
Weak social capital	102/159 (64.15%)		96/115 (83.48%)	
Strong social capital	312/447 (69.80%)		241/297 (81.14%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

*****Remained statistically significant after Bonferroni correction (p≤0.006).

Interestingly, combining multiple sex partners and unprotected sex into a risky sexual behaviour dependent variable changed the community/social factors, direction and strength of association. In Gauteng, women who agreed that they can easily use recreational facilities in their communities were 33% less likely (OR=0.67±0.12; 95% CI = 0.47-0.97; p=0.035) to have a combined risky sexual behaviour compared to those who disagreed (Table 26). On the other hand, those who agreed that a lot of people drink significantly heavily in their communities were nearly 1.6 times more likely (OR=1.59±0.35; 95% CI = 1.03-2.46; p=0.035) to have a combined risky sexual behaviour compared to those who disagreed (Table 26).

In the rural Western Cape, women who agreed that their community accepts alcohol abuse were 1.7 times more likely (OR=1.72±0.46; 95% CI = 1.02-2.91; p=0.04) to have a combined risky sexually behaviour compared to those who disagreed (Table 26). Interestingly, those women who generally agreed with the statement that their neighbours were helpful had nearly 1.8 times (OR=1.76±0.51; 95% CI = 0.99-3.10; p=0.049) probability of having a risky sexual behaviour, compared to those who generally disagreed with the statement (Table 26).

Table 26: Association of community/social support variables and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Availability of many recreational facilities in the community		0.490		0.069
Disagree	287/404 (71.04%)		271/335 (80.90%)	
Agree	138/202 (68.32%)		69/77(89.61%)	
Easy to use recreational facilities		**0.035**		0.083
Disagree	300/412 (72.82%)		267/330 (80.91%)	
Agree	125/194 (64.43%)		73/82 (89.02%)	
Easy to buy alcohol in the community		0.223		0.067
Disagree	81/108 (75.00%)		227/283 (80.21%)	
Agree	344/498 (69.08%)		113/129 (87.60%)	
Significant heavy drinking in the community		**0.035**		0.074
Disagree	66/107 (61.68%)		75/98 (76.53%)	
Agree	359/499 (71.94%)		265/314 (84.39%)	
Community accepts abuse of alcohol		0.084		**0.039**
Disagree	172/259 (66.41%)		167/212 (78.77%)	
Agree	253/347 (72.91%)		173/200 (86.50%)	
Helpful neighbours		0.308		**0.049**
Disagree	162/239 (67.78%)		68/90 (75.56%)	
Agree	263/367 (71.66%)		272/322 (84.47%)	
Close-knit community		0.639		0.317
Disagree	135/189 (71.43%)		18/24 (75.00%)	
Agree	290/417 (69.54%)		322/388 (82.99%)	
Social support		0.130		0.544
Weak social capital	104/159 (65.41%)		97/115 (84.35%)	
Strong social capital	321/447 (71.81%)		243/297 (81.82%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

*****Remained statistically significant after Bonferroni correction (p≤0.006).

3.2.7. General health, contraceptive/pregnancy and risky sexual behaviour

In both urban Gauteng (OR=0.24±0.06; 95% CI = 0.14–0.39; p< 0.001) and the rural Western Cape (OR=0.35±0.18; 95% CI = 0.13–0.95; p=0.033) women who reported having good health were less likely to have multiple sex partners compared to those who had poor health (Table 27).

Table 27: Association of general health, contraceptive/ pregnancy and multiple sex partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
General health		**<0.001***		**0.033**
Poor	33/100 (33.00%)		7/80 (8.75%)	
Good	45/431 (10.45%)		10/306 (3.27%)	
Lifetime contraceptive use		0.137		0.690
No	34/194 (17.53%)		7/177 (3.95%)	
Yes	43/336 (12.80%)		10/209 (4.78%)	
Current contraceptive use		0.809		0.935
No	16/97 (16.49%)		2/38 (5.26%)	
Yes	45/291(15.46%)		9/182 (4.95%)	
Effective contraceptive use		0.849		0.935
No	16/98 (16.33%)		2/38 (5.26%)	
Yes	45/290 (15.52%)		9/182 (4.95%)	
Parity		0.276		0.077
No	19/106 (17.92%)		4/41(9.76%)	
Yes	58/422 (13.74%)		13/345 (3.77%)	
Lifetime miscarriage		0.085		0.753
No	68/424 (16.04%)		13/306 (4.25%)	
Yes	9/98 (9.18%)		4/79 (87.65%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
*****Remained statistically significant after Bonferroni correction (p≤0.008).

In Gauteng, lifetime contraceptive use (OR=1.54±0.27; 95% CI = 1.08–2.19; p=0.015), parity (OR=3.83±0.77; 95% CI = 2.59–5.67; p<0.001), or lifetime miscarriage (OR=1.72±0.44; 95% CI = 1.05–2.85; p=0.031) were positively associated with unprotected sex, respectively (Table 28).

In the Western Cape, current contraceptive use (OR=3.07±1.30; 95% CI = 1.33–7.05; p=0.006), effective contraceptive use (OR=3.07±1.30; 95% CI = 1.33–7.05; p=0.006) or parity (OR=2.79±0.94; 95% CI = 1.43–5.43; p=0.002) were positively associated with unprotected sex, respectively (Table 28).

Table 28: Association of general health, contraceptive/ pregnancy and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
General health		0.193		0.777
Poor	83/113 (73.45%)		67/83 (80.72%)	
Good	331/493 (67.14%)		270/329 (82.07%)	
Lifetime contraceptive use		**0.015**		0.413
No	155/244 (63.52%)		155/188 (82.45%)	
Yes	258/354 (72.88%)		182/213 (85.45%)	
Current contraceptive use		0.417		**0.006***
No	77/100 (77.00%)		28/39 (71.79%)	
Yes	226/310 (72.90%)		164/185 (88.65%)	
Effective contraceptive use		0.496		**0.006***
No	78/102 (76.47%)		28/39 (71.79%)	
Yes	225/308 (73.05%)		164/185 (88.65%)	
Parity		**<0.001***		**0.002***
No	64/143 (44.76%)		34/50 (68.00%)	
Yes	348/460 (75.65%)		303/354 (85.59%)	
Lifetime miscarriage		**0.031**		0.447
No	328/491 (66.80%)		267/322 (82.92%)	
Yes	80/103 (77.67%)		70/81 (86.42%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
***Remained statistically significant after Bonferroni correction (p≤0.008).

The combined risky sexual behaviour variable had the same risk factors, direction and strength of association as the unprotected sex variable in both Gauteng and the Western Cape. In Gauteng, lifetime contraceptive use (OR=1.59±0.29; 95% CI = 1.11–2.27; p=0.010), parity (OR=3.44±0.68; 95% CI = 2.32–5.09; p<0.001), or lifetime miscarriage (OR=1.67±0.43; 95% CI = 1.00–2.77; p=0.047) were positively associated with unprotected sex, respectively (Table 28).

In the Western Cape, current contraceptive use (OR=3.24±1.38; 95% CI = 1.40–7.49; p=0.004), effective contraceptive use (OR=3.24±1.38; 95% CI = 1.40–7.49; p=0.004) or parity (OR=2.67±0.92; 95% CI = 1.35–5.24; p=0.003) were positively associated with unprotected sex, respectively (Table 29)

Table 29: Association of general health, contraceptive/ pregnancy and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
General health		0.124		0.873
Poor	86/113 (76.11%)		68/93 (81.93%)	
Good	339/493 (68.76%)		272/329 (82.67%)	
Lifetime contraceptive use		**0.010***		0.503
No	159/244 (65.16%)		157/188 (83.51%)	
Yes	265/354 (74.86%)		183/213 (85.92%)	
Current contraceptive use		0.398		**0.004***
No	79/100 (79.00%)		28/39 (71.79%)	
Yes	232/310 (74.84%)		165/185 (89.19%)	
Effective contraceptive use		0.483		**0.004***
No	80/102 (78.43%)		28/39 (71.79%)	
Yes	231/308 (75.00%)		165/185 (89.19%)	
Parity		**<0.001***		**0.003***
No	70/143 (48.95%)		35/50 (70.00%)	
Yes	353/460 (76.74%)		305/354 (86.16%)	
Lifetime miscarriage		**0.047**		0.362
No	338/491 (68.84%)		269/322 (83.54%)	
Yes	81/103 (78.64%)		71/81 (87.65%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
*Remained statistically significant after Bonferroni correction (p≤0.008).

3.2.8. Sex related variables and risky sexual behaviour

In Gauteng, women who reported having had sex under the influence of alcohol in the past 3 months (OR=2.92±1.10; 95% CI = 1.41–6.06; p=0.003) or who found it easy to buy condoms in the community (OR=3.29±1.22; 95% CI = 1.60–6.80; p=0.001), were at higher risk of having multiple sex partners, respectively (). In the rural Western Cape, women who reported that their most recent sex partner was either a husband or boyfriend were less likely (OR=0.19±0.10; 95% CI = 0.62–0.58; p=0.001) to have

multiple sex partners than those who reported that their last sex partner was somebody other than a husband or boyfriend (Table 30). Interestingly, the rural Western Cape women who responded that it was important to use a condom with a spouse or regular partner were more likely (OR=3.83±1.99; 95% CI = 1.38–10.63; p=0.006) to have multiple sex partners than those who responded that it was unimportant (Table 30).

Table 30: Association of sex related variables and multiple partners (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age of sex debut		0.06		0.848
< 18 years	41/203 (20.20%)		9/191 (4.71%)	
≥18 years	37/322 (11.49%)		8/186 (4.30%)	
The most recent sex partner		0.988		**0.001***
Husband/boyfriend	74/503 (14.71%)		12/353 (3.40%)	
Other	4/27 (14.81%)		5/32 (15.63%)	
Sex under alcohol influence in the past 3 months		**0.003***		0.365
None	60/470 (12.77%)		15/361 (4.16%)	
At least once	12/40 (30.00%)		2/25 (8.00%)	
Ease of buying condoms in the community		**0.001***		0.297
Not easy	9/141 (6.38%)		13/245 (5.31%)	
Easy	69/376 (18.35%)		4/134 (2.99%)	
Ease of getting free condoms		0.522		0.073
Not easy	1/12 (8.33%)		6/72 (8.33%)	
Easy	77/514(14.98%)		11/313 (3.51%)	
Importance of condom use with spouse/regular partner		0.167		**0.006***
Unimportant	17/148 (11.49%)		6/255 (2.35%)	
Important	61/375 (16.27%)		11/130 (8.46%)	
Importance of condom use with casual partner		0.842		0.122
Unimportant	4/30 (13.33%)		3/30 (10.00%)	
Important	73/498 (14.66%)		14/354 (3.95%)	

[a]Proportion of respondents with risky sexual behaviour
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
***Remained statistically significant after Bonferroni correction (p≤0.007).

In Gauteng, women who responded that it was important to use a condom with spouse or regular partner were less likely (OR=0.21±0.05; 95% CI = 0.12–0.36; p<0.001) to have unprotected sex than those who responded that it was unimportant (Table 31). Also, in the rural Western Cape, women who responded that it was important to use a

condom with spouse or regular partner were less likely (OR=0.31±0.09; 95% CI = 0.17–0.54; p<0.001) to have unprotected sex than those who responded that it was unimportant (Table 31). However, the rural Western Cape women who reported that their most recent sex partner was either a husband or boyfriend were more likely (OR=3.65±1.53; 95% CI = 1.61–8.29; p=0.001) to have unprotected sex than those who reported that their last sex partner was somebody other than a husband or boyfriend (Table 31).

Table 31: Association of sex related variables and unprotected sex (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age of sex debut		0.884		0.572
< 18 years	159/204 (77.94%)		169/191 (88.48%)	
≥18 years	250/323 (77.40%)		161/186 (86.56%)	
The most recent sex partner		0.667		**0.001***
Husband/boyfriend	392/505 (77.62%)		314/353 (88.95%)	
Other	20/27 (74.07%)		22/32 (68.75%)	
Sex under alcohol influence in the past 3 months		0.319		0.914
None	359/472 (76.06%)		315/361 (87.26%)	
At least once	34/41 (82.93%)		22/25 (88.00%)	
Ease of buying condoms in the community		0.100		0.769
Not easy	9/141 (6.38%)		214/253 (84.58%)	
Easy	69/376 (18.35%)		116/139 (83.45%)	
Ease of getting free condoms		0.305		0.266
Not easy	10/12 (83.33%)		61/76 (80.26%)	
Easy	401/576 (69.62%)		275/322 (85.40%)	
Importance of condom use with spouse/regular partner		**<0.001***		**<0.001***
Unimportant	137/154 (88.96%)		235/261 (90.04%)	
Important	271/430 (63.02%)		101/137 (73.72%)	
Importance of condom use with casual partner		0.067		0.378
Unimportant	27/32 (84.38%)		27/30 (90.00%)	
Important	385/557 (69.12%)		308/367 (83.92%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

***Remained statistically significant after Bonferroni correction (p≤0.007).

The urban women who reported that it was important to use a condom with a spouse or regular partner (OR=0.22±0.06; 95% CI=0.12–0.38; p<0.001) and important to use a condom with a casual partner (OR=0.34±0.19; 95% CI = 0.12-1.01; p=0.043) were at significantly lower risk of combined risky sexual behaviour respectively, compared to those who reported that it was not important (Table 32).

On the other hand, the rural Western Cape women whose most recent sex partner was a husband or boyfriend had significantly higher likelihood (OR=2.76±1.22; 95% CI = 1.15-6.58; p=0.02) of combined risky sexual behaviour (Table 32). However, those women who reported the importance of condom use with spouse/regular partner had significantly lower odds (OR=0.32±0.09; 95% CI = 0.18-0.56; p<0.001) of combined risky sexual behaviour (Table 32).

Table 32: Association of sex related variables and combined risky sexual behaviour (χ^2-test)

Region	**Gauteng**		**Western Cape**	
Variable	Proportion[a]	p-value[b]	Proportion[a]	p-value[b]
Age of sex debut		0.591		0.462
< 18 years	165/204 (80.88%)		171/191 (89.53%)	
≥18 years	255/323 (78.95%)		162/186 (87.10%)	
The most recent sex partner		0.472		**0.017**
Husband/boyfriend	403/505 (79.80%)		315/353 (89.24%)	
Other	20/27 (74.07%)		24/32 (75.00%)	
Sex under alcohol influence in the past 3 months		0.496		0.532
None	370/472 (78.39%)		317/361 (87.81%)	
At least once	34/41 (82.93%)		23/25 (92.00%)	
Ease of buying condoms in the community		0.516		0.750
Not easy	110/157 (70.06%)		216/253 (85.38%)	
Easy	305/419 (72.79%)		117/119 (84.17%)	
Ease of getting free condoms		0.369		0.436
Not easy	28/32 (87.50		63/76 (82.89%)	
Easy	395/557 (70.92%)		311/367 (84.74%)	
Importance of condom use with spouse/regular partner		**<0.001***		**<0.001***
Unimportant	138/154 (89.61%)		236/261 (90.42%)	
Important	281/430 (65.35%)		103/137 (75.18%)	
Importance of condom use with casual partner		**0.043**		0.436
Unimportant	28/32 (87.50%)		27/30 (90.00%)	
Important	395/557 (70.92%)		311/367 (84.74%)	

[a]Proportion of respondents with risky sexual behaviour

[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.

***Remained statistically significant after Bonferroni correction (p≤0.008).

3.3. Multivariate analysis of variables associated with risky sexual behaviour

To control for possible confounders, multivariate analysis was performed by entering all those independent variables that had a significant ($p < 0.05$) pair wise relationship with respective dependent variables (i.e. multiple sex partner, unprotected sex and combined risky sexual behavior) in the bivariate analysis into a stepwise, backward elimination multivariate logistic regression analysis.

3.3.1. Multivariate analysis of factors associated with multiple sex partners

For the urban Gauteng women, after entering all the alcohol related independent variables and possible confounders that were significantly ($p<0.05$) associated with multiple sex partners in the univariate logistic regression analysis, into a stepwise backward elimination multivariate logistic regression analysis; only binge drinking retained significance (OR=2.92±1.04; 95% CI=1.45–5.89; p=0.003) as a risk factor for multiple sex partners (Table 33). Gauteng women who had a currently working partner (OR=0.48±0.15; 95% CI=0.26–0.90; p=0.022), or had a close knit community (OR=0.47±0.14; 95% CI=0.26–0.85; p=0.013), or had apparent good health (OR=0.25±0.07; 95% CI=0.13–0.46; p<0.001), respectively, remained less likely to have multiple partners (Table 33).

For the rural Western Cape women, only good health (OR=0.28±1.6; 95% CI=0.09–0.87; p=0.028), being of Coloured race (OR=0.24±0.16; 95% CI=0.06–0.91; p=0.036) or having had a husband or boyfriend as recent sex partner (OR=0.19±0.12; 95% CI=0.05–0.67; p=0.010), respectively remained protective for having multiple sex partners (Table 33).

Table 33: Multivariate logistic regression analysis of variables associated with multiple sex partners

Region	**Gauteng**		**Western Cape**	
Variable	OR ± SE (95% CI)[a]	p-value[b]	OR ± SE (95% CI)[a]	p-value[b]
Binge drinking	2.92±1.04 (1.44–5.89)	**0.003***	–	–
Currently employed partner	0.48±0.15 (0.26–0.90)	**0.022**	–	–
Close-knit community	0.47±0.14 (0.26–0.85)	**0.013***	–	–
Good Health	0.25±0.07 (0.13–0.46)	**<0.001***	0.28±1.6 (0.09–0.87)	**0.028**
Coloured Race	–	–	0.24±0.16 (0.06–0.91)	**0.036**
Recent sex partner husband/boyfriend	–	–	0.19±0.12 (0.05–0.67)	**0.010***

[a]OR (Odds Ratio) is relative to the naturally coded response (usually 0) and was calculated with standard error (SE) at 95% confidence interval (CI). The OR ≥ 1.5 and ≤ 0.5 suggests significantly stronger and weak associations, respectively.
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
***Remained statistically significant after Bonferroni correction (p≤0.0125).
–: Variables not included in multivariate analysis.

3.3.2. Multivariate analysis of factors associated with unprotected sex

In Gauteng, women who were traditionally married (OR=0.26±0.06; 95% CI=0.16–0.41; p<0.01) or who responded that it was important to use a condom with spouse/regular partner (OR=0.25±0.07; 95% CI=0.15–0.45; p<0.01) remained less likely to have unprotected sex (Table 34). Risk drinking was the only variable that remained a risk factor (OR=2.20±0.88; 95% CI=1.00–4.82; p<0.049) for unprotected sex in the urban Gauteng women (Table 34). In the rural Western Cape, women who had currently employed partners (OR=11.83±9.91; 95% CI=2.29–61.01; p=0.03) or who were currently using contraceptives (OR=3.28±1.97; 95% CI=1.04–10.65; p=0.047) were at higher risk of having unprotected sex (Table 34).

Table 34: Multivariate logistic regression analysis of variables associated with unprotected sex

Region	**Gauteng**		**Western Cape**	
Variable	OR ± SE (95% CI)[a]	p-value[b]	OR ± SE (95% CI)[a]	p-value[b]
Traditional married	0.26±0.06 (0.16–0.41)	**<0.001***	–	–
Risk drinking	2.20±0.88 (1.00–4.82)	**0.049**	–	–
Importance of using a condom with regular partner	0.25±0.07 (0.15–0.45)	**<0.001***	–	–
Currently employed partner	–	–	11.83±9.91 (2.29–61.01)	**0.003***
Current use of contraceptives	–	–	3.28±1.97 (1.04–10.65)	**0.047**

[a]OR (Odds Ratio) is relative to the naturally coded response (usually 0) and was calculated with standard error (SE) at 95% confidence interval (CI). The OR ≥ 1.5 and ≤ 0.5 suggests significantly stronger and weak associations, respectively.
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
***Remained statistically significant after Bonferroni correction (p≤0.016).
–: Variables not included in multivariate analysis.

3.3.3. Multivariate analysis of factors associated with combined risky sexual behaviour

In Gauteng, only women who had partners aged ≥30 years (OR=2.78±0.72; 95% CI=1.67–4.61; p<0.001) remained at risk of having combined risky sexual behaviour (Table 35). Perceived easy access to recreational facilities (OR=0.57±0.15; 95% CI=0.34–0.96; p=0.033) and perceived importance of condom use with regular partner (OR=0.25±0.09; 95% CI=0.12–0.51; p<0.001) were the only two variables that retained significant protective factor for combined risky sexual behaviour in the urban women (Table 35).

For the rural Western Cape women, only current working partner (OR=0.57±0.15; 95% CI=0.34–0.96; p=0.033) and current use of contraceptives (OR=3.28±1.97; 95% CI=1.01–10.65; p=0.47) seem to have retained significance as risk factor for combined risky sexual behaviour in the multivariate logistic regression model (Table 35).

Table 35: Multivariate logistic regression analysis of variables associated with combined risky sexual behaviour

Region	**Gauteng**		**Western Cape**	
Variable	OR ± SE (95% CI)[a]	p-value[b]	OR ± SE (95% CI)[a]	p-value[b]
Age partner ≥30 yrs	2.78±0.72 (1.67–4.61)	**<0.001***	–	–
Easy to use recreational facilities	0.57±0.15 (0.34–0.96)	**0.033**	–	–
Importance of condom use with spouse/regular partner	0.25±0.09 (0.12–0.51)	**<0.001***	–	–
Currently employed partner	-	-	11.83±9.91 (2.29–61.01)	**0.003***
Current use of contraceptives	–	–	3.28±1.97 (1.01–10.65)	**0.047**

[a]OR (Odds Ratio) is relative to the naturally coded response (usually 0) and was calculated with standard error (SE) at 95% confidence interval (CI). The OR ≥ 1.5 and ≤ 0.5 suggests significantly stronger and weak associations, respectively.
[b]P-value of ≤ 0.05 denotes statistically significant association and p-value > 0.05 denotes no statistically significant association.
*****Remained statistically significant after Bonferroni correction (p≤0.016).
–: Variables not included in multivariate analysis.

Chapter Four

4.0. Discussion

This study fulfilled the general aim of this mini-thesis by analysing alcohol consumption variables and possible confounding risk factors associated with risky sexual behaviour amongst women of reproductive age between 18-44 years around the urban city of Tshwane in Gauteng and the rural wine farming community in the Western Cape. Women from the two sites differed significantly in terms of several variables, which included alcohol consumption and other substance use variables, demographic variables, socio-economic and household hunger variables, psycho-social variables, current partner characteristics variables, community and social support variables, general and reproductive health variables and sexual behaviour variables because the urban Gauteng site is cosmopolitan, multi-cultural, industrialised and form part of the economic hub of South Africa with access to disposal cash. In contrast, the rural Western Cape is provincial, has circumscribed networks and limited economy with little mobility and access to disposal cash; and yet has an abundance of cheap wine (London, 1999) and significant alcohol abuse tendencies among women (Ojo *et al.*, 2010).

The compelling common denominator in the urban Gauteng and the rural Western Cape is that the majority of women interviewed from both sites had combined risky sexual behaviour. Specifically, about 70% of the women in urban Gauteng and nearly 83% in the rural Western Cape had combined risky sexual behaviour. As per *ad hoc* definition of the variable, in Gauteng nearly 15% of women had multiple sex partners and 68.32% did not always use a condom, suggesting that they must have had at least one episode of unprotected sex. In the rural Western Cape, risky sexual behaviour was

made of 81.80% of women who did not always use a condom (i.e. had unprotected sex) and 4.40% of women who had multiple sex partners. This suggested different driving forces for risky sexual behaviours in the two sites.

Findings from multivariate logistic regression analyses that binge drinking and risk drinking significantly increased the odds of multiple sex partners and unprotected sex, respectively, in the urban Gauteng women, is consistent with results from a previous study in Gauteng (Morojele et al., 2006). The finding also resonates with several similar studies from developing (P. S. Chandra et al., 2003) and developed countries (Graves, 1995; T. K. MacDonald et al., 2000b). In contrast, alcohol dependence, which is pathological and the severest form of alcohol abuse was not positively associated with any of the forms of risky sexual behaviour. This is probably because people dependent on alcohol have sexual dysfunctions (Arackal & Benegal, 2007) and thus may loose an inclination to have sex. It could also be that the women who were dependent on alcohol had confabulations (i.e. memory disturbances/distortions) and did not even remember having sex or it could be that because of their probable unhygienic state no one was sexually attracted to them.

Interestingly, while there was a significantly higher percentages of alcohol users in the rural Western Cape by any definition − including risk drinkers, than in the urban Gauteng; risky drinking or any form of alcohol use was not a significant risk factor for multiple sex partners, unprotected sex or even the combined risky sexual behaviour in the rural Western Cape women. Despite the general limitations of this study, which are discussed below, these results appear to support my study hypothesis that: "alcohol use among urban South African women is associated with risky sexual behaviour, whereas

alcohol use among rural South African women may play a very different kind of role such as being used for pastime or recreational purpose.

Contrary to several studies conducted in South Africa and other African countries that showed significant associations between risky sexual behaviour and (a) socio-economic status (Bainame, 1997; Dunkle et al., 2004), (b) household hunger/food insufficiency (Oyefara, 2007; Weiser et al., 2007) and (c) education (Mbewu, 2005; Shisana & Simbayi, 2002), in the current study none of these variables had significant association with risky sexual behaviour in both the urban and rural sites. The primary reason for these discrepancies included the unary or poor response for certain questions/variables, and in some instances a small sample size with limited power to detect certain associations, especially in the multiple logistic regression modelling. For instance, in Gauteng all the women had primary or lower education (unary response as per definition of the variable), which made it impossible to determine a relationship between education level and risky sexual behaviour. Furthermore, only two respondents reported household hunger in Gauteng and although the two respondents also had risky sexual behaviour there was no significant association because of a limited number of observations. The variable was automatically dropped in the univariate/bivariate logistic regression analysis because there were simply very few observations. Those variables that were significantly associated with risky sexual behaviour in the univariate/bivariate analysis such as high SES, which was a protective factor for risky sexual behaviour in the urban women; and household hunger, which was a risk factor for risky sexual behaviour in the rural women, lost significance and were dropped respectively in the multivariate logistic regression analysis. The second reason for the discrepancy might reside in the fact that most of the published studies

cited above that showed significant association between risky sexual behaviour and the SES variables, which included household hunger and education, defined risky sexual behaviour directly in the context of being HIV infected and/or prostitution. In the current study there were no questions directly related to HIV infection or prostitution presumably because of the sensitivity of the issues. Hence risky sexual behaviour was defined differently and rather tacitly.

Although not conclusive, predictions from the univariate logistic regression analysis that older Gauteng woman, i.e. 25-34 and 35-44 years respectively, were at significantly higher risk for having unprotected sex and combined risky sexual behaviour compared to their younger counterparts (18-24 years) was contrary to recently published study done in the same city and province, which showed that younger women were more prone to risky sexual behaviour, usually with older men for material gain (Morojele et al., 2006). However, prediction from the univariate and multivariate logistic analyses that urban Gauteng women who had older partner (≥30 years old) were at significantly higher odds of having unprotected sex or combined risky sexual behaviour corroborates findings from the same study (Morojele et al., 2006).

Some predictions from the univariate logistic regression analysis, although not supported by published literature are compatible with common sense. For instance, predictions that legally married women and women with children in both the urban and rural site had significantly higher chances of having unprotected sex makes perfect common sense. This is common sense because legally married people generally do not

use a condom because of a perceived sense of trust; and women with children must have had unprotected sex.

Other findings compatible with common sense from the univariate logistic regression analysis are that urban and rural women who believed that the use of condom with a regular partner such as husband/boyfriend was important had significantly lower odds of having unprotected sex or combined risky sexual behaviour. This finding was not surprising since beliefs often drive behaviour. In addition, more than 90% of the women in both the urban and rural sites reported that their most recent partner was either husband or boyfriend. By extension, this meant that most women only had sex with their regular partners especially in view of the fact that the majority of women in both provinces reported to have had only one sex partner in the last 3 months of the interview. Common sense dictates that those women who believed that the use of condom with a regular partner was important would certainly hold the same if not a stronger belief regarding a casual partner, if they had one. To add weight to this argument, perceived importance of condom use with a regular partner retained significance as a protective factor for risky sexual behaviour among the urban women in the multivariate logistic modelling. In the rural women it lost significance as a protective factor for risky sexual behaviour most probably because of the common problem of the small sub-strata sample size.

Perceived importance of condom use with a casual partner was also a significant protective factor for the urban women in the univariate logistic regression analysis. But strangely it was not for the rural women probably because the rural women did not see

the importance of condom use with a casual partner since most of them did not have a casual partner.

What is interesting is that reported ease of availability of condoms was not a significant protective factor for risky sexual behaviour in both the urban and rural sites, suggesting that the reason women did not use condoms was not because they were not available. Instead, the reason for not using condoms could be the stigma associated with condom use in certain cultures or the inability for the women to negotiate condom use for a variety of other reasons. For most women, the use of condoms especially with a regular sexual partners is restricted by the high value placed on fertility, the negative association of condoms with prostitution or promiscuity, and the women's limited ability to influence decision-making in this area (Mill & Anarfi, 2002). Low socioeconomic status among women has been shown to be associated with inconsistent condom use in sub-Saharan Africa (Dunkle et al., 2004; Gillespie & Kadiyala, 2005).

Perceived easy access to recreational facilities was also a significant protective factor for risky sexual behaviour in the urban women as determined by both the univariate/bivariate and multiple logistic regression analysis. This made sense because perceived lack of access to recreational facilities might leave sex as the only option for recreation to certain women. On the other hand, social support might be better available to those women for whom recreational facilities are available. Furthermore, condoms are often made available at recreational facilities, meaning that condoms may be less available when these facilities are absent.

Strangely, rural women who reported that they had helpful neighbours were at significantly higher risk of having unprotected sex or risky sexual behaviour as

determined by the univariate/bivariate logistic regression analysis. This is strange because logically one would think that helpful neighbours will be protective for any risky behaviour. Unless the rural women understood the statement "people around here are willing to help their neighbours" to mean that giving sexual favours for whatever reason also implied being helpful as sometimes colloquially used by some South Africans.

In addition to the surprising results predicted by the univariate/bivariate logistic regression for the rural women, the multivariate logistic modelling predicted that the rural women who had a current working partner were at significantly high odds or more likely to have unprotected sex or a risky sexually behaviour. This finding is counter-intuitive but it may suggest that currently working partners of the rural women had much power to control relationships including demanding unprotected sex. An employed partner is also indicative of financial stability, which better allows for one to have children and raise them. This would be associated with greater levels of unprotected sex when trying to get pregnant. In practice, the vast majority of rural women living on farms have working partners because if you are a man and do not work you are not allowed to stay in the farm.

In addition, the vast majority (90.5%) of the rural Western Cape women were Coloured. Therefore, it makes sense that being Coloured would be protective for having multiple sex partners as per multivariable regression analysis, because the majority of these women probably lived with their partners. The small proportion of the rural women (4%) who reported that their partners were not working probably constituted the 7% of women who were African and whose partners were unemployed

in the cities. These women, while they were likely to take precautions and use condoms (i.e. have protected sex) they were also likely to have casual multiple sex partners because they were living on their own and were probably providing sex in exchange of material gain as it has been reported in other studies (Morojele *et al.*, 2006); Kalichman *et al.*, 2012b)

In the multivariable analyses, good health was protective for having multiple sex partners in the Gauteng and Western Cape women. The plausible explanation is that the women with good health probably have a better outlook to life, are of higher socio-economic status and probably in stable relationships and therefore less prone to having multiple sex partners. On the other hand, those women with poor health are probably from low socioeconomic status, which has been shown to be positively associated with risky sexual behaviour in South Africa (Dunkle *et al.*, 2004; Gillespie & Kadiyala, 2005; Kalichman *et al.*, 2012b).

In general, while all the variables that were significant risk or protective factors for multiple sex partners, unprotected sex or combined risky sexual behaviour in the urban Gauteng women were logically and/or mostly consistent with previously published work, some variables that were significant risk or protective factors for multiple sex partners, unprotected sex or combined risky sexual in the rural women were either counter-intuitive or inconclusive. This may be the result of several limitations of this study discussed below.

Limitations

The first and most obvious limitation of this study is the unary or poor responses for certain questions/variables and a small sample size with limited power to detect certain associations. The second limitation is that results are based on cross-sectional data, which makes it difficult to determine temporal relationships between risk factors and outcomes. Third, being confined to women aged between 18 and 44 years, the study excluded adolescent women. While the risk factors for adolescents may be different from those of older women, inclusion of females below 18 years is essential because they are an important target group given that they are also prone to risky sexual behaviour. Fourth, lack of data on personal and household income resulted in the reliance of the asset score as the main measure of socio-economic status. Fifth, substance use including alcohol and talking about sex-related issues openly are sensitive subjects to women that may lead to underreporting. Finally, while the urban Gauteng is likely to resemble other urban metropolitan areas in South Africa, the rural wine farming Western Cape site is most likely different from other rural areas in South Africa such as former homelands and commercial farm in the Free state . Therefore the generalisation of the results, especially to other rural areas, should only be done with caution.

Implications

The implication from this study is that the findings may be used to inform further research on risk factors for risky sexual behaviour among women of reproductive age in other regions of South Africa. This study has confirmed that risky sexual behaviour, in particular unprotected sex, is a common problem among women in both the urban Gauteng and the rural Western Cape. The results suggest that sex education awareness

and alcohol rehabilitation programmes targeted to women who are risky drinkers in the urban Gauteng is needed. Furthermore, increasing access to recreational facilities and underscoring the importance of condom use can help mitigate the problem among the urban Gauteng women. Likewise, in the rural Western Cape emphasizing the importance of condom use with regular or casual partner could also help mitigate the problem.

References

Arackal, B. S., & Benegal, V. (2007). Prevalence of sexual dysfunction in male subjects with alcohol dependence. *Indian J Psychiatry,* 49(2), 109-112.

Baer, J. S. (1994). Effects of college residence on percieved norms for alcohol consumption: An examination of the first year in college. *Physchol. Addict. Behav.,* 8, 43-50.

Bainame, L. G. (1997). The socio-economic and cultural context of the spread of HIV/AIDS in Botswana. *Health Transition Rev.,* 7, 97-107.

Baliunas, D., Rehm, J., Irving, H., & Shuper, P. (2010). Alcohol consumption and risk of incident human immunodeficiency virus infection: a meta-analysis. *Int J Public Health,* 55(3), 159-166.

Barnett, T., Whiteside, A., & Decosas, J. (2000). The Jaipur paradigm--a conceptual framework for understanding social susceptibility and vulnerability to HIV. *S Afr Med J,* 90(11), 1098-1101.

Beisel, W. R. (1987). Role of nutrition in immune system diseases. *Compr Ther,* 13(1), 13-19.

Buseh, A. G., Glass, L. K., & McElmurry, B. J. (2002). Cultural and gender issues related to HIV/AIDS prevention in rural Swaziland: a focus group analysis. *Health Care Women Int,* 23(2), 173-184.

Caspi, A., Begg, D., Dickson, N., Harrington, H., Langley, J., Moffit, T. E., & Silva, P. A. (1997). Personality differences predict health-risk behaviors in young adulthood: Evidence from a longitudinal study. *J. Pers. Social Behav,* 73, 1052-1063.

Chandra, P. S., Krishna, V. A., Benegal, V., & Ramakrishna, J. (2003). High-risk sexual behaviour & sensation seeking among heavy alcohol users. *Indian J Med Res,* 117, 88-92.

Chandra, R. K. (2002). Nutrition and the immune system from birth to old age. *Eur J Clin Nutr,* 56 Suppl 3, S73-76.

Cooper, M. L. (1992). Alcohol and increased behavioral risk for AIDS. *Alcohol Health Res. World,* 16, 64-72.

Cooper, M. L. (2002). Alcohol use and risky sexual behavior among college students and youth: evaluating the evidence. *Journal of studies on alcohol,* Supplemet 24, 101-117.

Cooper, M. L., Agocha, V. B., & Sheldon, M. S. (2000). A motivational perspective on risky behaviors: the role of personality and affect regulatory processes. *J Pers,* 68(6), 1059-1088.

Dal Cin, S., MacDonald, T. K., Fong, G. T., Zanna, M. P., & Elton-Marshall, T. E. (2006). Remembering the message: the use of a reminder cue to increase condom use following a safer sex intervention. *Health Psychol,* 25(3), 438-443.

Dallabetta, G. A., Miotti, P. G., Chiphangwi, J. D., Saah, A. J., Liomba, G., Odaka, N., Sungani, F., & Hoover, D. R. (1993). High socioeconomic status is a risk factor for human immunodeficiency virus type 1 (HIV-1) infection but not for sexually transmitted diseases in women in Malawi: implications for HIV-1 control. *J Infect Dis,* 167(1), 36-42.

de Waal, A., & Whiteside, A. (2003). New variant famine: AIDS and food crisis in southern Africa. *Lancet,* 362(9391), 1234-1237.

Decosas, J., & Adrien, A. (1997). Migration and HIV. *Aids,* 11 Suppl A, S77-84.

DoH. (2011). The 2011 National Antenatal Sentinel HIV & Syphillis Prevalence Survey in South Africa. In S. A. Department of Health (Ed.).

Doherty, T., & Colvin, M. (2004). HIV/AIDS. *South African Health Review,* Chapter 14, 191-212.

Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntryre, J. A., & Harlow, S. D. (2004). Transactional sex among women in Soweto, South Africa: prevalence, risk factors and association with HIV infection. *Soc Sci Med,* 59(8), 1581-1592.

George, W. H., Stoner, S. A., Norris, J., Lopez, P. A., & Lehman, G. L. (2000). Alcohol expectancies and sexuality: a self-fulfilling prophecy analysis of dyadic perceptions and behavior. *J Stud Alcohol,* 61(1), 168-176.

Gillespie, S., & Kadiyala, S. (2005). *HIV/AIDS and food and nutrition security: form evidence to action*.

Graves, K. L. (1995). Risky sexual behavior and alcohol use among young adults: results from a national survey. *Am J Health Promot,* 10(1), 27-36.

Halpern-Felsher, B. L., Millstein, S. G., & Ellen, J. M. (1996). Relationship of alcohol use and risky sexual behavior: a review and analysis of findings. *J Adolesc Health,* 19(5), 331-336.

Howell, D. C. (1987). *Statistical Methods for Psychology*. Boston: PWS-Kent.

Idehen, E. E. (2001). The development and evaluation of a religiosity scale. *IFE Psychology IA,* 9(2), 58-69.

IOM (1998). Migration and AIDS. *Int Migr,* 36(4), 445-468.

IOM. (2010). World migration report 2010.

Justus, A. N., Finn, P. R., & Steinmetz, J. E. (2000). The influence of traits of disinhibition on the association between alcohol use and risky sexual behavior. *Alcohol Clin Exp Res,* 24(7), 1028-1035.

Kalichman, S. C., & Cain, D. (2004). A prospective study of sensation seeking and alcohol use as predictors of sexual risk behaviors among men and women receiving sexually transmitted infection clinic services. *Psychol Addict Behav,* 18(4), 367-373.

Kalichman, S. C., Cain, D., & Simbayi, L. C. (2011). Multiple recent sexual partnerships and alcohol use among sexually transmitted infection clinic patients, Cape Town, South Africa. *Sex Transm Dis,* 38(1), 18-23.

Kalichman, S. C., Heckman, T., & Kelly, J. A. (1996). Sensation seeking as an explanation for the association between substance use and HIV-related risky sexual behavior. *Arch Sex Behav,* 25(2), 141-154.

Kalichman, S. C., Pitpitan, E., Eaton, L., Cain, D., Carey, K. B., Carey, M. P., Harel, O., Mehlomakhulu, V., Simbayi, L. C., & Mwaba, K. (2012a). Bringing it home: community survey of HIV risks to primary sex partners of men and women in alcohol-serving establishments in Cape Town, South Africa. *Sex Transm Infect*.

Kalichman, S. C., Watt, M., Sikkema, K., Skinner, D., & Pieterse, D. (2012b). Food Insufficiency, Substance Use, and Sexual Risks for HIV/AIDS in Informal Drinking Establishments, Cape Town, South Africa. *J Urban Health,* 89(6), 939-951.

Kark, S. L. (1949). The social pathology of syphilis in Africans. *S Afr Med J,* 23, 77-84.

Kiene, S. M., Simbayi, L. C., Abrams, A., Cloete, A., Tennen, H., & Fisher, J. D. (2008). High rates of unprotected sex occurring among HIV-positive

individuals in a daily diary study in South Africa: the role of alcohol use. *J Acquir Immune Defic Syndr,* 49(2), 219-226.

Kirsten, J., & Vink, N. (2003). Agricultural policy changes in South Africa, 1996-2002. Socio-economic analyses and policy implication of the roles of agriculture in developing countries pp. 1-32). Rome, Italy.

Lang, A. R. (1985). The social psychology of drinking and human sexuality. *J. Drug Issues,* 15, 273-289.

Leigh, B. C., & Stall, R. (1993). Substance use and risky sexual behavior for exposure to HIV. Issues in methodology, interpretation, and prevention. *Am Psychol,* 48(10), 1035-1045.

London, L. (1999). The 'dop' system, alcohol abuse and social control amongst farm workers in South Africa: a public health challenge. *Soc Sci Med,* 48(10), 1407-1414.

Lowry, R., Holtzman, D., Truman, B. I., Kann, L., Collins, J. L., & Kolbe, L. J. (1994). Substance use and HIV-related sexual behaviors among US high school students: are they related? *Am J Public Health,* 84(7), 1116-1120.

Lurie, M., Pronyk, P., de Moor, E., Heyer, A., de Bruyn, G., Struthers, H., McIntyre, J., Gray, G., Marinda, E., Klipstein-Grobusch, K., & Martinson, N. (2008). Sexual behavior and reproductive health among HIV-infected patients in urban and rural South Africa. *J Acquir Immune Defic Syndr,* 47(4), 484-493.

MacDonald, D. S. (1996). Notes on the socio-economic and cultural factors influencing the transmission of HIV in Botswana. *Soc Sci Med,* 42(9), 1325-1333.

MacDonald, T. K., Fong, G. T., Zanna, M. P., & Martineau, A. M. (2000a). Alcohol myopia and condom use: can alcohol intoxication be associated with more prudent behavior? *J Pers Soc Psychol,* 78(4), 605-619.

MacDonald, T. K., MacDonald, G., Zanna, M. P., & Fong, G. T. (2000b). Alcohol, sexual arousal, and intentions to use condoms in young men: applying alcohol myopia theory to risky sexual behavior. *Health Psychol,* 19(3), 290-298.

MacDonald, T. K., Zanna, M. P., & Fong, G. T. (1995). Decision making in altered states: effects of alcohol on attitudes toward drinking and driving. *J Pers Soc Psychol,* 68(6), 973-985.

Marcos, A., Nova, E., & Montero, A. (2003). Changes in the immune system are conditioned by nutrition. *Eur J Clin Nutr,* 57 Suppl 1, S66-69.

Martin, K. S., Rogers, B. L., Cook, J. T., & Joseph, H. M. (2004). Social capital is associated with decreased risk of hunger. *Soc Sci Med,* 58(12), 2645-2654.

Mbewu, A. D. (2005). The socio-economic impact of HIV and AIDS. *MRC: Presentation to the Portfolio Committee on Science and Technology,* March 16, 1-8.

McEwan, R. T., McCallum, A., Bhopal, R. S., & Madhok, R. (1992). Sex and the risk of HIV infection: the role of alcohol. *Br J Addict,* 87(4), 577-584.

Mill, J. E., & Anarfi, J. K. (2002). HIV risk environment for Ghanaian women: challenges to prevention. *Soc Sci Med,* 54(3), 325-337.

Morejele, N. K., London, L., Olorunju, S. A., Matjila, M. J., & Davids, A. S. (2010). Predictors of risk of alcohol-eposed pregnancies among women in an urban and a rural are of South Africa. *Soc Sci Med,* 70, 534-542.

Morojele, N. K., Kachieng'a, M. A., Mokoko, E., Nkoko, M. A., Parry, C. D., Nkowane, A. M., Moshia, K. M., & Saxena, S. (2006). Alcohol use and sexual behaviour among risky drinkers and bar and shebeen patrons in Gauteng province, South Africa. *Soc Sci Med,* 62(1), 217-227.

Myer, L., Morroni, C., & Susser, E. S. (2003). Commentary: the social pathology of the HIV/AIDS pandemic. *Int J Epidemiol,* 32(2), 189-192.

O'Leary, A., Goodhart, F., Jemmott, L. S., & Boccher-Lattimore, D. (1992). Predictors of safer sex on the college campus: a social cognitive theory analysis. *J Am Coll Health,* 40(6), 254-263.

Ojo, O. A., Louwagie, G., Morojele, N., Rendall-Mkosi, K., London, L., Olorunju, S., & Davids, A. (2010). Factors associated with female high-risk drinking in a rural and an urban South African site. *S Afr Med J,* 100(3), 180-182.

Oyefara, J. L. (2007). Food insecurity, HIV/AIDS pandemic and sexual behaviour of female commercial sex workers in Lagos metropolis, Nigeria. *Sahara J,* 4(2), 626-635.

Rajaraman, D., Russell, S., & Heymann, J. (2006). HIV/AIDS, income loss and economic survival in Botswana. *AIDS Care,* 18(7), 656-662.

Reddy, P. S., Mbewu, A. D., & Nogoduka, C. M. (2003). Commentary: sexually transmitted infection in South Africa: 50 years after Sidney Kark. *Int J Epidemiol,* 32(2), 187-189.

Rehm, J., Shield, K. D., Joharchi, N., & Shuper, P. A. (2011). Alcohol consumption and the intention to engage in unprotected sex: systematic review and meta-analysis of experimental studies. *Addiction,* 107(1), 51-59.

Rollins, N. C., Coovadia, H. M., Bland, R. M., Coutsoudis, A., Bennish, M. L., Patel, D., & Newell, M. L. (2007). Pregnancy outcomes in HIV-infected and uninfected women in rural and urban South Africa. *J Acquir Immune Defic Syndr,* 44(3), 321-328.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton NJ: Princeton University Press.

Santelli, J. S., Brener, N. D., Lowry, R., Bhatt, A., & Zabin, L. S. (1998). Multiple sexual partners among U.S. adolescents and young adults. *Fam Plann Perspect,* 30(6), 271-275.

Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II. *Addiction,* 88(6), 791-804.

Shisana, O., & Simbayi, L. (2002). Nelson Mandela/HSRC Study of HIV/AIDS: South African National HIV Prevalence, Behavioural Risks and Mass Media Household Survey. *Human Sciences Research Council*.

Shuper, P. A., Joharchi, N., Irving, H., & Rehm, J. (2009). Alcohol as a correlate of unprotected sexual behavior among people living with HIV/AIDS: review and meta-analysis. *AIDS Behav,* 13(6), 1021-1036.

Shuper, P. A., Neuman, M., Kanteres, F., Baliunas, D., Joharchi, N., & Rehm, J. (2010). Causal considerations on alcohol and HIV/AIDS--a systematic review. *Alcohol Alcohol,* 45(2), 159-166.

Statistics South Africa (2003). Census 2001. Census in Brief. *Pretoria: Statistics South Africa*.

Steele, C. M., & Josephs, R. A. (1990). Alcohol myopia. Its prized and dangerous effects. *Am Psychol,* 45(8), 921-933.

Taylor-Seehafer, M., & Rew, L. (2000). Risky sexual behavior among adolescent women. *J Soc Pediatr Nurs,* 5(1), 15-25.

UNAIDS (2001). *Population Mobility and AIDS*. Geneva: UNAIDS.

UNAIDS. (2012). UNAIDS report on the global AIDS epidemic 2012.

Wechsler, H., Davenport, A., Dowdall, G., Moeykens, B., & Castillo, S. (1994). Health and behavioral consequences of binge drinking in college. A national survey of students at 140 campuses. *Jama,* 272(21), 1672-1677.

Wechsler, H., Dowdall, G. W., Davenport, A., & Castillo, S. (1995). Correlates of college student binge drinking. *Am J Public Health,* 85(7), 921-926.

Weiser, S. D., Leiter, K., Bangsberg, D. R., Butler, L. M., Percy-de Korte, F., Hlanze, Z., Phaladze, N., Iacopino, V., & Heisler, M. (2007). Food insufficiency is associated with high-risk sexual behavior among women in Botswana and Swaziland. *PLoS Med,* 4(10), 1589-1597; discussion 1598.

Wood, E., Montaner, J. S., Chan, K., Tyndall, M. W., Schechter, M. T., Bangsberg, D., O'Shaughnessy, M. V., & Hogg, R. S. (2002). Socioeconomic status, access to triple therapy, and survival from HIV-disease since 1996. *Aids,* 16(15), 2065-2072.

Appendix A

WOMEN, PREGNANCY AND HEALTH QUESTIONNAIRE

ENGLISH

Questionnaire Number	
Interviewer Number	
Enumerator Area	

University of Pretoria

MRC SOUTH AFRICA

UNIVERSITY OF CAPE TOWN

TIME NOW: _____

DATE: _____

GENERAL INSTRUCTIONS

We will work through the questionnaire as follows: All your answers will be marked in my copy of the questionnaire. I will ask the questions and give you the answer choices. You will have a copy of the questionnaire so that you can follow along. Pick the answer that is the closest to how you feel. Usually I will want you to tell me the number that goes with the answer you pick. The interview will take between forty five minutes and one hour to complete.

Please note that there are no right or wrong answers to the questions asked. Please feel free to answer just what you think. If there are questions you really do not want to answer, you may skip them.

PLEASE REMEMBER THAT YOUR NAME WILL NOT BE PUT ON THIS QUESTIONNAIRE. Your answers will not be shared with anyone. Only the research staff will have access to the questionnaire once it has been completed.

Thank you for helping us with this study.

Section 1: Demographic Characteristics

First we would like to ask you a few questions about yourself.

Throughout the questionnaire, please circle the correct response.

1.1 How old are you? _____years

1.2 What is the highest level of education you have passed?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub B/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school –	15
Degree	16

1.3 What is your current marital status?

Legally married	1
Traditionally married	2
Living with man or woman in	3
Never married/Single	4
Divorced	5
Married but separated	6
Widow	7

1.4 Which of the following is the main language spoken at home? (Please circle only one)

English	1
Afrikaans	2
IsiXhosa	3
IsiZulu	4
SeSotho	5
SeTswana	6
SePedi	7
SiSwati	8
TshiVenda	9
Zitsonga	10
IsiNdebele	11
Other (Please	12

1.5 Which race group do you consider yourself to belong to?

Black/African	1
Coloured	2
White	3
Asian/Indian	4
Other (Please	5

Section 2: Economic factors

Now we would like to ask a few questions about you, your work and the money that is available to you to spend.

2.1 Have you done any paid work in the last 12 months?

No	0
Yes	1

2.2 Which of the following describes your current employment status?

Unemployed	1
Employed part-time	2
Employed full-time	3
Self-employed	4

2.3 What kind of work do you do? (If working, please tell me your occupation. For example, plumber, street trader, cattle farmer, primary school teacher, domestic worker)

Not working	0
Working (Please	1

2.4 If you are not working, how do you spend your free time when other people are at work?

2.5 Please indicate which of the following are your sources of income. Please answer this question whether or not you are working.

		Yes	No
A	Work	1	0
B	Spouse/partner	1	0
C	Parents	1	0
D	Brothers and/or sisters	1	0
E	Children	1	0
F	Child Support Grant	1	0
G	State Old Age Pensions	1	0
H	Disability Grant	1	0
I	Care Dependency Grant	1	0
J	Foster Care Grant	1	0
K	Grants-in-Aid	1	0
L	Workman's Compensation Fund	1	0
M	Other (Please specify)	1	0

Section 3: Household factors

3.1 Is the house you live in:

Owned by your family	1
Rented	2
Owned by farmer	3
Other (please specify)	4

3.2 How many rooms are there in the house?

☐ Rooms

3.3 How many bedrooms are there in the house?

☐ Bedrooms

3.4 How many bathrooms are there in the house?

☐ Bathrooms

3.5 Does your house have:

		Yes	No
A	Electricity	1	0
B	A radio	1	0
C	A television	1	0
D	A telephone	1	0
E	A fridge	1	0
F	A computer	1	0
G	A washing machine	1	0
H	A cell phone (anybody)	1	0

3.6 Which of the following live in the same household with you?

		Yes	No
A	Live alone	1	0
B	Husband	1	0
C	Partner	1	0
D	Child or Children	1	0
E	Brother(s) and/or	1	0
F	Mother/Female guardian	1	0
G	Father/Male guardian	1	0
H	Grandparent(s)	1	0
I	Other (please specify)	1	0

3.7 How many people usually live and sleep in your household?

☐ Number of people

3.8 Let us speak about your household and what it can afford. How often do the people here go hungry or have no food to eat?

Never	0
Seldom	1
Sometimes	2
Often	3

3.9 Your family has enough money for:

		Never	Some-times	Always	Not Applicable
A	Buying food	0	1	2	9
B	Paying for transport (bus, taxi, train fare, petrol bills)	0	1	2	9
C	Paying bills (rent, light, water, telephone, etc.)	0	1	2	9
D	Paying doctors and for medicine	0	1	2	9
E	Buying school supplies, uniforms, books, shoes	0	1	2	9
F	Buying clothes	0	1	2	9
G	Buying firewood, coal, paraffin	0	1	2	9
H	Paying for funerals and other ceremonies/festivities	0	1	2	9

Section 4: Community

4.1 For how long have you lived in this community?

	Years
	Months

Please indicate the extent to which you agree with the following statements about your community.

		Strongly Agree	Moderately Agree	Neither Agree Nor Disagree	Moderately Disagree	Strongly Disagree
4.2	There are many recreational facilities in your community	0	1	2	3	4
4.3	You can easily use the recreational facilities in your community	0	1	2	3	4
4.4	It is easy for you to buy alcohol in your community if you want to	0	1	2	3	4
4.5	A lot of people drink heavily in your community	0	1	2	3	4
4.6	Your community accepts the abuse of alcohol	0	1	2	3	4
4.7	There are many advertisements of alcoholic drinks in your community	0	1	2	3	4
4.8	People around here are willing to help their neighbours	0	1	2	3	4
4.9	This is a close-knit or tight neighbourhood where people generally know each other	0	1	2	3	4
4.10	If you had to borrow R100 in an emergency, you could borrow it from a neighbour	0	1	2	3	4
4.11	People in this neighbourhood generally don't get along with each other	0	1	2	3	4
4.12	People in this neighbourhood can be trusted	0	1	2	3	4
4.13	If you were sick you could count on your neighbours to shop for groceries for you	0	1	2	3	4
4.14	People in this neighbourhood do not share the same values	0	1	2	3	4

Section 5: Your feelings about yourself

Below is a list of statements dealing with your general feelings about yourself. Please indicate the extent to which you agree with each statement.

		Strongly agree	Agree	Disagree	Strongly disagree
5.1	On the whole, I am satisfied with myself	1	2	3	4
5.2	At times, I think I am no good at all	1	2	3	4
5.3	I feel that I have a number of good qualities	1	2	3	4
5.4	I am able to do things as well as most people	1	2	3	4
5.5	I feel I do not have much to be proud of	1	2	3	4
5.6	I certainly feel useless at times	1	2	3	4
5.7	I feel that I am a person of worth, at least on an equal plane with others	1	2	3	4
5.8	I wish I could have more respect for myself	1	2	3	4
5.9	All in all, I am inclined to feel that I am a failure	1	2	3	4
5.10	I take a positive attitude towards myself	1	2	3	4

Section 6: Health

6.1 In general, would you say your health is:

Excellent	1
Very Good	2
Good	3
Fair	4
Poor	5

6.2 For how long (if at all) has your health limited you in each of the following activities? Please choose one number on each line.

		Limited for more than 3 months	Limited for 3 months or less	Not limited at all
A	The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports	1	2	3
B	The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries	1	2	3
C	Walking uphill or climbing a flight of stairs	1	2	3
D	Bending, lifting or stooping	1	2	3
E	Taking a ten-minute walk	1	2	3
F	Eating, dressing, bathing or using the toilet	1	2	3

6.3 How much bodily pain have you had during the past 4 weeks?

None	1
Very Mild	2
Mild	3
Moderate	4
Severe	5
Very Severe	6

6.4 Does your health keep you from working at a job, doing work around the house or going to school?

Yes, for more than 3 months	1
Yes, for 3 months or less	2
No	3

6.5 Have you been unable to do certain kinds or amounts of work, housework or schoolwork because of your health?

Yes, for more than 3 months	1
Yes, for 3 months or less	2
No	3

For each of the following questions, please choose the number for the one answer that comes closest to the way you have been feeling during the past month.

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
6.6	How much of the time, during the past month, has your health limited your social activities (like visiting friends or close relatives)?	1	2	3	4	5	6
6.7	How much of the time, during the past month, have you been a very nervous person?	1	2	3	4	5	6
6.8	During the past month, how much of the time have you felt calm and peaceful?	1	2	3	4	5	6
6.9	How much of the time, during the past month, have you felt downhearted and blue?	1	2	3	4	5	6
6.10	During the past month, how much of the time have you been a happy person?	1	2	3	4	5	6
6.11	How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6

6.12 Please choose the number that best describes the extent to which each of the following statements is true or false for you.

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	I am somewhat ill	1	2	3	4	5
B	I am as healthy as anybody I know	1	2	3	4	5
C	My health is excellent	1	2	3	4	5
D	I have been feeling bad lately	1	2	3	4	5

Section 7: Alcohol Use

The questions in this section are about your drinking of alcoholic beverages.

7.1 Have you ever had a drink containing alcohol?

No	0
Yes	1

IF NO PLEASE GO TO QUESTION 7.26.

7.2 How old were you when you first started drinking alcohol?

	Years

7.3 Do you still take a drink with alcohol sometimes?

No	0
Yes	1

7.4 Why did you stop drinking alcohol?

Not applicable/still	9

7.5 When did you stop drinking alcohol?

0-6 months ago	1
7-12 months ago	2
13-24 months ago	3
25-36 months ago	4
37 months or more	5
Not applicable	9

IF YOU HAVE NOT HAD AN ALCOHOLIC DRINK IN THE PAST YEAR, PLEASE GO TO QUESTION 7.26.

7.6 How often do you have a drink containing alcohol?

Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

7.7 On how many days have you drunk alcohol during the past month?

	Days

7.8 What type(s) of alcoholic beverages do you usually drink?

		Yes	No
A	Beer	1	0
B	Cider (e.g. Crossbow, Crown, Hunters, Redds, Savannah, Strongbow)	1	0
C	Bottled wine	1	0
D	Papsak wine	1	0
E	Coolers (e.g. Archers, Bacardi Breezer, Brutal Fruit, Esprit, Hooch, Red Square, Smirnoff Spin, Smirnoff Storm, Smirnoff Triple Spin, Solantis)	1	0
F	Spirits (e.g. gin, whisky, vodka, brandy)	1	0
G	Liqueurs (e.g. Amarula)	1	0
H	Home brew	1	0

7.9 Where do you buy your alcohol?

		Yes	No
A	I do not buy my alcohol	1	0
B	Liquor store	1	0
C	Supermarket/Café	1	0
D	Spaza shop	1	0
E	Night club/Disco	1	0
F	Shebeen	1	0
G	Restaurant/Pub	1	0
H	Tavern	1	0
I	Neighbour	1	0
J	Other (Please specify)	1	0

7.10 When you are not paying for your alcohol, how do you get it?

		Yes	No
A	I make it myself	1	0
B	I get it on credit	1	0
C	I work for it	1	0
D	I exchange goods (e.g. clothes) for it	1	0
E	It is bought for me/given to me	1	0
F	I take it without paying for it	1	0
G	Other (Please specify)	1	0

7.11 How many drinks containing alcohol do you have on a typical day when you are drinking? (Please note that one drink is equivalent to one can or bottle of beer, cider or coolers, one glass of wine, or one tot of spirits).

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5
Other, please specify. If you drink homebrew please indicate the name of the homebrew, type of container, and quantity consumed.	6

7.12 In which of the following type(s) of venues or events do you usually drink alcohol?

		Yes	No
A	Home	1	0
B	Park/Outdoors	1	0
C	Restaurant	1	0
D	Tavern	1	0
E	Shebeen	1	0
F	Bar	1	0
G	Car park(s)	1	0
H	Friend's home	1	0
I	Party	1	0
J	Festival/Concert	1	0
K	Other (please specify)	1	0

7.13 With whom do you usually drink alcohol? (Please circle only one)

Alone	1
With friend(s)	2
With relative(s)	3
With partner	4
With whoever is in the drinking	5
With other (please specify)	6

Below is a list of questions about your drinking behaviour. Please choose the option that best reflects your behaviour

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7.14	How often do you have six or more drinks on one occasion?	0	1	2	3	4
7.15	How often during the last year have you found that you were unable to stop drinking once you had started?	0	1	2	3	4
7.16	How often during the last year have you failed to do what was normally expected from you because of drinking?	0	1	2	3	4
7.17	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	0	1	2	3	4
7.18	How often during the last year have you had a feeling of guilt or remorse after drinking?	0	1	2	3	4
7.19	How often during the last year have you been unable to remember what happened the night before because you had been drinking?	0	1	2	3	4
7.20	Have you or someone else been injured as a result of your drinking?	0	1	2	3	4
7.21	Has a relative, friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?	0	1	2	3	4

7.22 Have you ever felt you ought to cut down drinking?

No	0
Yes	1

7.23 Have people annoyed you for criticising your drinking?

No	0
Yes	1

7.24 Have you ever felt guilty about your drinking?

No	0
Yes	1

7.25 Have you ever had a drink first thing in the morning?

No	0
Yes	1

7.26 Whom among the following family members has had an alcohol problem?

		Yes	No
A	Mother	1	0
B	Father	1	0
C	Uncle	1	0
D	Aunt	1	0
E	Sister	1	0
F	Brother	1	0

7.27 Are there any warning labels about the health risks of drinking alcohol on any alcohol containers?

No	0
Yes	1
Do not know	2

7.28 Does the drinking of alcohol during pregnancy have any effect on the unborn foetus?

No	0
Yes	1
Sometimes	2
Don’t know	3

7.29 In what ways can a baby be affected if a mother drinks in pregnancy?

[This question is to be coded by the interviewer, according to the instructions received.]

	Yes	No
A Social integration	1	0
B Physical growth	1	0
C Intellectual ability	1	0
D Learning problems	1	0
E Behavioural problems	1	0
F Specific facial features	1	0
G Speech problems	1	0
H Other (please specify)	1	0

Section 8: Smoking and Other Drug Use

8.1 Have you ever tried or experimented with cigarette smoking, even one or two puffs?

No	0
Yes	1

8.2 How old were you when you smoked a whole cigarette for the first time?

	Years

8.3 Have you ever smoked at least 100 cigarettes (5 packets of cigarettes) or the equivalent amount of tobacco in your lifetime?

No	0
Yes	1

8.4 During the past 30 days, on how many days did you smoke cigarettes?

	Days

8.5 During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

I did not smoke during the past 30 days	0
Less than 1 cigarette per day	1
1 cigarette per day	2
2 to 5 cigarettes per day	3
6 to 10 cigarettes per day	4
11 to 20 cigarettes per day	5
More than 20 cigarettes per day	6

8.6 Have you ever used snuff?

No	0
Yes	1

8.7 How old were you when you first used snuff? CIRCLE 99 IF YOU HAVE NEVER USED SNUFF.

	Years
99	

8.8 During the past 30 days, on how many days did you use snuff?

	Days

8.9 Have you ever taken medicines for purposes other than their intended use (e.g. to change the way you feel, think, or behave)?

		Yes	No
A	Over-the-counter medication	1	0
B	Prescription medication	1	0

8.10 Have you ever used any of the following drugs?

		Yes	No
A	Dagga	1	0
B	Mandrax	1	0
C	Heroin	1	0
D	Crack/cocaine	1	0
E	Ecstasy	1	0
F	Methamphetamine (tik)	1	0
G	Other	1	0

8.11 During the past 30 days, on how many days did you use each of the following drugs, if at all?

		0 days	1 or 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
A	Dagga	0	1	2	3	4	5	6
B	Mandrax	0	1	2	3	4	5	6
C	Heroin	0	1	2	3	4	5	6
D	Crack/cocaine	0	1	2	3	4	5	6
E	Ecstasy	0	1	2	3	4	5	6
F	Methamphetamine (tik)	0	1	2	3	4	5	6
G	Over-the-counter medication (not for its intended use)	0	1	2	3	4	5	6
H	Prescription medication (not for its intended use)	0	1	2	3	4	5	6
I	Other	0	1	2	3	4	5	6

Section 9: Sexual Behaviour

This section deals with sexual behaviour. Please note that these questions concern any male partner, including husbands, males with whom you are cohabiting, or other partners.

9.1 When was the last time you had sex, if ever?

Never	0
Within the last week	1
Within the last month	2
More than one month ago	3

IF YOU HAVE NEVER HAD SEX, PLEASE GO TO QUESTION 10.5

9.2 Who did you last have sex with?

Husband	1
Boyfriend	2
Other regular partner	3
Casual acquaintance	4
Someone just met	5
Other (Please specify)	6

9.3 How old were you when you first had sex?

	Years

9.4 What is the total number of sexual partners you have had in the past three months?

None	0
1	1
2-3	2
4-5	3
6-7	4
8-9	5
More than 9	6

9.5 How often have you had sex under the influence of alcohol in the past three months?

Never	0
1-3 times	1
4-6 times	2
7-9 times	3
10-12 times	4
More than 12 times	5

Section 10: Use of Condoms

The questions in this section concern condom use.

10.1 How frequently have you used condoms with your spouse or regular partner(s) in the past 3 months?

Never	0
Seldom	1
Sometimes	2
Always	3
Not applicable (respondent had no spouse or regular partner in the past three months)	9

10.2 How frequently have you used condoms with casual partners in the past 3 months?

Never	0
Seldom	1
Sometimes	2
Always	3
Not applicable (respondent had no casual partner in the past three months)	9

10.3 The last time you had sex, was a condom used?

No	0
Yes	1
Don't know	2
Not applicable	9

10.4 Why did you not use a condom the last time you had sex?

		Yes	No	Not Applicab
A	I did not want to use a condom	1	0	9
B	I did not need to use a condom	1	0	9
C	I did not like condoms	1	0	9
D	I did not know about condoms	1	0	9
E	I did not have a condom	1	0	9
F	Other (Please specify)	1	0	9
G	I used a condom the last time I	1	0	9

10.5 Where can you get condoms from?

		Yes	No
A	Government Hospital	1	0
B	Day Hospital/Clinic	1	0
C	Community Health Centre	1	0
D	Family Planning Clinic	1	0
E	Mobile Clinic	1	0
F	Community Health Worker	1	0
F	Private Hospital/Clinic	1	0
G	Pharmacy	1	0
H	Private Doctor	1	0
I	Supermarket	1	0
J	Filling station	1	0
K	Other (Please specify)	1	0

10.6 How easy is it for you to buy condoms in your community?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3

10.7 How easy is it for you to get free condoms from clinics in your community?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3

10.8 How important is it for you to use condoms when you have sexual intercourse with a casual partner?

Extremely important	0
Quite important	1
Quite unimportant	2
Extremely unimportant	3

10.9 How important is it for you to use condoms when you have sexual intercourse with your regular partner?

Extremely important	0
Quite important	1
Quite unimportant	2
Extremely unimportant	3

Section 11: Use of Contraceptives

11.1 How old were you when you had your first period?

Less than ten years old	1
Ten to fifteen years old	2
Sixteen to twenty years old	3
Beyond twenty years old	4

11.2 Have you ever used anything or tried in any way to delay or avoid getting pregnant?

No	0
Yes	1

11.3 Which is the main method that you are using now to delay or avoid getting pregnant?

Pill	1
IUD	2
Injections	3
Diaphragm/foam/jelly	4
Condom	5
Female sterilisation	6
Male sterilisation	7
Calendar/rhythm	8
Withdrawal	9
Traditional herbs/remedies	10
Abstinence	11
Other (Please specify)	12
None	99

11.4 How long have you used this method?

	Years
	Months
99	Not applicable

11.5 Which are the methods that you have used in the past to delay or avoid getting pregnant?

		Yes	No
A	Pill	1	0
B	IUD	1	0
C	Injections	1	0
D	Diaphragm/foam/jelly	1	0
E	Condom	1	0
F	Female sterilisation	1	0
G	Male sterilisation	1	0
H	Calendar/rhythm	1	0
I	Withdrawal	1	0
J	Traditional herbs/remedies	1	0
K	Abstinence	1	0
L	Other (Please specify)	1	0
M	Unsure	1	0
N	None	1	0

11.6 Where do/did you obtain the method you are using currently?

Government Hospital	1
Government Clinic	2
Community Health Centre	3
Family Planning Clinic	4
Private Hospital	5
Private Clinic	6
Private Doctor	7
Mobile clinic	8
Pharmacy/Chemist	9
Traditional healer	10
Faith healer	11
Don't know	12
Other (Please specify)	13
Not applicable	99

11.7 How old were you when you first used something to avoid getting pregnant?

	Years
99	Not applicable

11.8 From whom did you first get information about methods to avoid pregnancy? (Circle as many as apply)

		Yes	No
A	Mother	1	0
B	Sister	1	0
C	Father	1	0
D	Other Relative	1	0
E	Friend	1	0
F	Teacher	1	0
G	Nurse	1	0
H	Doctor	1	0
I	Social Worker	1	0
J	Poster/Leaflet/Magazine	1	0
K	Radio/Television	1	0
L	Other (Please specify)	1	0

11.9 Did your parent(s) or guardian(s) give you advice on contraceptives or explain how to use them?

No	0
Yes	1

Section 12: Social Support

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

		None of the time	A little of the time	Some of the time	Most of the time	All of the time
12.1	Someone you can count on to listen to you when you need to talk	1	2	3	4	5
12.2	Someone to give you information to help you understand a situation	1	2	3	4	5
12.3	Someone to give you good advice about a crisis	1	2	3	4	5
12.4	Someone to confide in or talk to about yourself or your problems	1	2	3	4	5
12.5	Someone whose advice you really want	1	2	3	4	5
12.6	Someone to share your most private worries and fears with	1	2	3	4	5
12.7	Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
12.8	Someone who understands your problems	1	2	3	4	5
12.9	Someone who shows you love and affection	1	2	3	4	5
12.10	Someone to love and make you feel wanted	1	2	3	4	5
12.11	Someone who hugs you	1	2	3	4	5
12.12	Someone to have a good time with	1	2	3	4	5
12.13	Someone to get together with for relaxation	1	2	3	4	5
12.14	Someone to do something enjoyable with	1	2	3	4	5

Section 13: Culture

This section has questions concerning your culture. We are interested in knowing what kinds of behaviour would be considered to be in accordance with your culture and the kinds of behaviours that would be unacceptable according to your culture.

13.1 According to your culture men are entitled to have as many children as they wish to have

Strongly agree	1
Moderately agree	2
Moderately disagree	3
Strongly disagree	4

13.2 According to your culture, how wrong is it not to have children if you do not want to?

Always wrong	1
Usually wrong	2
Sometimes wrong	3
Never wrong	4

13.3 According to your culture, having children is a sign that you are a worthy woman.

Very true	1
Somewhat true	2
Somewhat untrue	3
Very untrue	4

13.4 According to your culture, for a man to have children is a sign that he is a worthy man.

Very true	1
Somewhat true	2
Somewhat untrue	3
Very untrue	4

Section 14: Pregnancy Experiences

Now I would like to ask you about your pregnancies and the health of your last born child.

14.1 How many children have you given birth to in your lifetime?

None	0
One	1
Two	2
Three	3
Four	4
Five	5
Six	6
Seven	7
Eight	8
Nine	9
Ten	10
More than ten	11

14.2 How many miscarriages have you had in total, if any?

None	0
1 to 2	1
3 to 4	2
5 or more	3

IF NEVER PREGNANT AND NEVER HAD MISCARRIAGES, PLEASE GO TO SECTION 17.

14.3 At the time you became pregnant with your last child, how much did you want to become pregnant then?

A great deal	1
A little	2
Not much	3
Not at all	4

IF RESPONDENT ANSWERED "A GREAT DEAL", THEN Q14.4 SHOULD BE "NOT APPLICABLE"

14.4 How much longer would you like to have waited?

	Months
	Years
9	Not applicable

14.5 When you were pregnant, to whom did you go for antenatal care for this pregnancy? (Circle as many as apply)

		Yes	No
A	No one	1	0

B	Doctor	1	0
C	Nurse/midwife	1	0
D	Traditional birth attendant	1	0
E	Other person (Please specify)	1	0

14.6 Where did you go for antenatal care the majority of times during the last pregnancy?

Public hospital	1
Private hospital	2
Public clinic	3
Public surgery	4
Private midwife's office	5
Other (please specify)	6
Not applicable	9

14.7 How many months pregnant were you when you first received antenatal care?

[ ] Months

14.8 How many times did you go for antenatal appointments during this pregnancy?

[ ] Times

14.9 What was the outcome of the pregnancy?

Full-term	1
Pre-term (premature)	2
Still-born	3
Voluntarily terminated pregnancy	4
Miscarriage	5

14.10 Did you have any complications at birth?

No	0
Yes (please specify)	1

14.11 Where did you give birth?

Home	1
Government Hospital	2
Day hospital/clinic/community health centre	3
Private hospital/clinic	4
Other (Please specify)	5

14.12 Who assisted with the delivery? (Please circle as many as apply)

	Yes	No
A. Doctor	1	0
B. Nurse/midwife	1	0
C. Traditional birth attendant	1	0
D. Relative/friend	1	0
E. Other (please specify)	1	0

14.13 Was your child delivered by caesarean section?

No	0
Yes	1

14.14 How much did your child weigh at birth?

	Kilograms
99	Do not know/do not

14.15. How old were you when you gave birth to your last child?

	Years
99	Do not know/do not

Section 15: Pregnancy and Alcohol Use

I would like you to now think about this pregnancy or the last time you became pregnant.

15.1 How many months pregnant are you right now?

Not Pregnant	0
1 month	1
2 months	2
3 months	3
4 months	4
5 months	5
6 months	6
7 months	7
8 months	8
9 months	9
Do not know	10

15.2 When last were you pregnant?

In the past year	1
More than one year but less than two years	2
More than two years but less than three	3
More than three years but less than four	4
More than four years but less than five	5
More than five years ago	6

15.3 Did you plan to stop smoking because of the pregnancy?

No	0
Yes	1
Not applicable/Not smoking at time of falling pregnant	9

15.4 Did you plan to stop drinking because of the pregnancy?

No	0
Yes	1
Not applicable/Not drinking at time of falling pregnant	9

IF NOT APPLICABLE, PLEASE GO TO QUESTION 16.1

15.5 Whom among the following has advised you to stop drinking during pregnancy? (Please circle as many as apply)

		Yes	No
A	No one	1	0
B	Doctor	1	0
C	Nurse/midwife	1	0
D	Social Worker	1	0

E	Traditional birth attendant	1	0
F	Other person (please specify)	1	0

15.6 Please specify how your drinking changed when you received the advice, and the reason(s) for the change:

I stopped drinking	0	
I reduced my drinking	1	
My drinking did not change	2	
I increased my drinking	3	

15.7 Which of the following factors made it difficult for you to stop drinking during pregnancy?

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	Influences from my friend(s)	0	1	2	3	4
B	Influences from my	0	1	2	3	4
C	Influences from family	0	1	2	3	4
D	Stress	0	1	2	3	4
E	I felt addicted	0	1	2	3	4
F	I enjoyed drinking too much	0	1	2	3	4

15.8 Which of the following factors made it easy for you to stop drinking during pregnancy?

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	My friend(s)	0	1	2	3	4
B	My partner(s)	0	1	2	3	4
C	Family members	0	1	2	3	4
D	Health and/or Social	0	1	2	3	4
E	Lack of stress	0	1	2	3	4
F	I did not feel addicted	0	1	2	3	4
G	I did not enjoy drinking	0	1	2	3	4

15.9 During the three months before you became pregnant, how often did you have a drink containing alcohol?

Never	0
Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

15.10 During the three months before you became pregnant, on what days did you drink alcohol?

Never	0
Occasionally	1
Weekdays only	2
Weekends only	3
Weekdays and weekends	4

15.11 During the three months before you became pregnant, how many drinks containing alcohol did you have on a typical day when you were drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5
Other, please specify. If the respondent drank homebrew please ask her to indicate the name of the homebrew, type of container, and quantity consumed.	6

Now I would like you to think about the period during which you were pregnant…

15.12 After you knew you were pregnant, how often did you have a drink containing alcohol?

Never	0
Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

15.13 After you knew you were pregnant, on what days did you drink alcohol?

Never	0
Occasionally	1
Weekdays only	2
Weekends only	3
Weekdays and weekends	4

15.14 After you knew you were pregnant, how many drinks containing alcohol did you have on a typical day when you were drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5
Other, please specify. If the respondent drank homebrew please ask her to indicate the name of the homebrew, type of container, and quantity consumed.	6

15.15 After you knew you were pregnant, how easy/difficult was it to reduce/stop your drinking?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3
I did not try to reduce my drinking/I never	9

Now I would like to ask you about your next pregnancy, if you were to become pregnant again in the future.

15.16 For you to abstain from alcohol during your next pregnancy would be:

Extremely good	1
Moderately good	2
Neither good nor bad	3
Moderately bad	4
Extremely bad	5

15.17 For you to abstain from alcohol during your next pregnancy would be:

Extremely easy	1
Moderately easy	2
Neither easy nor difficult	3
Moderately difficult	4
Extremely difficult	5

15.18 For you to abstain from alcohol during your next pregnancy would be:

Completely under your control	1
Moderately under your control	2
Neither under your control nor not under your	3
Moderately not under your control	4
Extremely not under your control	5

15.19 Most people who are important to you think that you should abstain from alcohol during your next pregnancy:

Strongly agree	1
Moderately agree	2
Neither agree nor disagree	3
Moderately disagree	4
Strongly disagree	5

15.20 How likely is it that you will abstain from alcohol during your next pregnancy?

Extremely likely	1

Moderately likely	2
Neither likely nor unlikely	3
Moderately unlikely	4
Extremely unlikely	5

The next questions are about the health of your last born child, and of your children in general.

15.21 If your child has any problems, how severe are they?

	Not at all	Mildly	Moderately	Severely	Not applicable
A Social integration	0	1	2	3	9
B Physical growth	0	1	2	3	9
C Intellectual ability	0	1	2	3	9
D Learning	0	1	2	3	9
E Behavioural	0	1	2	3	9
F Specific facial	0	1	2	3	9
G Speech/language	0	1	2	3	9

15.22 Have you ever been told that a child of yours has foetal alcohol syndrome?

No	0
Yes	1
Maybe	2
Not applicable	9

Section 16: Male partners

The questions in this section are about the man who was in your life at the time of your last pregnancy.

16.1 Who was in your life?

No one	0
Father of the child	1
Someone else	2

IF NO ONE WAS IN YOUR LIFE AT THE TIME OF YOUR LAST PREGNANCY, PLEASE GO TO SECTION 18

16.2 How old was he then? _____years

16.3 What was the highest (standard/year) he completed at school?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub b/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school –	15
Degree	16
Do not know	17

16.4 Did he work?

No	0
Yes	1

16.5 What was his occupation? That is, what kind of work did he mainly do?

Not working	9
Type of work	

Please indicate how strongly you agree or disagree with the following statements.

		Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree
16.6	You were satisfied with your relationship with this person	1	2	3	4	5
16.7	Sometimes there were serious disagreements between you and him	1	2	3	4	5
16.8	Sometimes there was hitting or slapping between you and him	1	2	3	4	5
16.9	You had a lot of control in your relationship with him	1	2	3	4	5
16.10	There was a lot of trust between you and him	1	2	3	4	5

Now I would like to ask about his drinking of alcoholic beverages.

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
16.11	How often did he have a drink containing alcohol?	0	1	2	3	4
16.12	How often did you drink with him?	0	1	2	3	4
16.13	How often did he have six or more drinks on one occasion?	0	1	2	3	4

Now I would like to ask about the effect of his drinking of alcoholic beverages

		No	Yes	Don't know
16.14	Was he or someone else ever injured as a result of his drinking?	0	1	2
16.15	Did a relative, friend, or a doctor or other health worker ever express concern about his drinking or suggest that he cut down?	0	1	2

16.16 How many drinks containing alcohol did he have on a typical day when he was drinking?

None	0

1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5

16.17 Did you feel obliged to drink alcohol when your partner was drinking?

Never	0
Sometimes	1
Always	2

Section 17: Your Current Partner

We would now like to ask the same questions about your current partner, whether or not he is the same man we just spoke about.

17.1 Who is your current partner?

No one	0
Father of the child	1
Someone else	2

IF NO ONE, PLEASE MOVE TO SECTION 18.

17.2 Is your current partner the person you just spoke about in Section 16?

No	0
Yes	1

17.3 How old is he now? _____ years

17.4 What was the highest (standard/year) he completed at school?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub B/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school –	15
Degree	16

17.5 Does he currently work?

No	0
Yes	1

17.6 What is his occupation? That is, what kind of work does he mainly do?

Not working	9
Type of work	

Please indicate how strongly you agree or disagree with the following statements.

	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree
17.7 You are satisfied with your relationship with this person	1	2	3	4	5
17.8 Sometimes there are serious disagreements between you and him	1	2	3	4	5
17.9 Sometimes there is hitting or slapping between you and him	1	2	3	4	5
17.10 You have a lot of control in your relationship with him	1	2	3	4	5
17.11 There is a lot of trust between you and him	1	2	3	4	5

Now I would like to ask about his drinking of alcoholic beverages.

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
17.12	How often does he have a drink containing alcohol?	0	1	2	3	4
17.13	How often do you drink with him?	0	1	2	3	4
17.14	How often does he have six or more drinks on one occasion?	0	1	2	3	4

Now I would like to ask about the effect of his drinking of alcoholic beverages

		No	Yes	Don't know
17.15	Has he or someone else ever been injured as a result of his drinking?	0	1	2
17.17	Did a relative, friend, or a doctor or other health worker ever express concern about his drinking or suggest that he cut down?	0	1	2

17.17 How many drinks containing alcohol does he have on a typical day when he is drinking?

None	0
1 or 2	1

3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5

17.18 Do you feel obliged to drink alcohol when your partner is drinking?

No	0
Yes	1

Section 18: Religious Orientation

These questions inquire about some aspects of your religious life. Please answer each by choosing the option which best represents your normal practice.

18.1 How religious do you consider yourself to be?

Very religious	1
Quite religious	2
Fairly religious	3
Not very religious	4
Not at all religious	5

18.2 How often do you attend religious services?

Frequently	1
Often	2
Sometimes	3
Seldom	4
Never	5

18.3 How often do you pray?

Five times a day	1
More than twice a day	2
Once a day	3
Only when necessary	4
Seldom if ever	5

18.4 How often do you read the Holy Scriptures/Quran…..?

Daily	1
Often	2
Occasionally	3
Seldom	4
Never	5

18.5 How often do you watch or listen to religious programmes on television or radio?

Always	1
Frequently	2
Sometimes	3
Rarely	4
Never	5

18.6 How important is your religious belief in your daily life?

Of utmost importance	1
Of great importance	2
Of some importance	3

Of little importance	4
Of no importance	5

Section 19:Mass Media

Finally, this last section asks about you and the mass media: radio, television, newspapers and magazines.

19.1 Which magazine do you read most often?

19.2 Which local newspaper do you read most often?

19.3 Which national newspaper do you read most often?

19.4 Which radio station do you listen to most often?

19.5 Which television channel do you watch most often?

THANK YOU VERY MUCH

WE REALLY APPRECIATE YOUR HELP

I certify that this interview has been completed in full; with the respondent and according to the instructions I received from the trainers; and that the information I received will be kept strictly confidential.

SIGNED:

_____
(INTERVIEWER'S SIGNATURE)

_____
(DATE)

_____
(EXACT TIME OF COMPLETION)